

Informal Paratransit in Mexico City

INAUGURAL - DISSERTATION

zur

Erlangung der philosophischen Doktorwürde

vorgelegt der

PHILOSOPHISCHEN FAKULTÄT II

der

UNIVERSITÄT ZÜRICH

von

LINDA ULRICH-SUTHERLAND

von

London, England und Unterstammheim, Zürich

Begutachtet von den Herren

Prof. Dr. A. Leemann

PD Dr. K. Graf

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Abstract

This thesis is the result of a year's fieldwork in Mexico City, looking at the organisation and growth of the collective taxi sector. The Mexican collective taxis were taken as an example of informal paratransit and were examined in the light of three hypotheses: that the informal transport sector has only so far been developed in the Third World; that collective taxi lines are established to cope and adapt themselves to increased urban demand; and that the paratransit sector supplies the public with a specialized service.

Paratransit is taken to mean the use of existing infrastructure by a non-scheduled and smaller capacity vehicle than the public bus, but carrying more passengers than the private car. These systems are looked at on a world level and we see that most paratransit services use rented vehicles, move faster and charge more than the public bus system, and many are outside the law.

In Mexico City the study looked at the collective taxi in general and also at three case-study routes of differing lengths and serving different publics. Passengers, drivers and route presidents were questioned in order to examine the parameters of public demand, how far this demand is satisfied and what type of service the collective taxi supplies.

Based on the Mexico City example, it is possible to isolate the characteristics of paratransit which are particularly useful to rapid increase in urban transport demand and to promote the creation of an efficient paratransit system in other urban areas.

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Abbreviations and Notes

BART	Bay Area Rapid Transit (The San Francisco Underground System)
CBD	Central Business District
COVITUR	Comision de Vialidad y Transporte Urbano (Traffic and Urban Transport Commission)
DF	Distrito Federal (Federal District of Mexico)
ISTME	Ingenieria de Sistemas de Transporte Metropolitano (Metropolitan Transport Systems Engineering)
STC	Sistema de Transporte Colectivo (the Mexican underground system)
Translations	All translations from Spanish in the thesis are the responsibility of the author
The Peso	At the time of study the Swiss franc was 13 pesos and the English pound was 50 pesos

Foreword

I travelled to Mexico City in 1974 to study for seven months on a British Council Exchange Scholarship. The seven months lengthened to two and a half years as the Mexico City area grew and the transport situation that I was studying became more unsolvable - and also more interesting. At the time, it was hoped that the new underground system would solve the above-ground problems. In mid-1977, however, when I returned to Mexico City to look at the process of transport planning that has created the Metro, it was obvious that the network was overloaded and could never move the enormous transport demand alone. Thus during 1977, I began to use and appreciate the 'pesero' or collective taxi network in central Mexico City. This was a working example of the better use of cars in cities: a solution that American car-pool programmes were searching for. Unlike most high technology transport solutions which Mexico 'imports' from the United States, the Mexico City collective taxi is a transport idea that can be 'exported' to developed countries. The enormous growth in this sector experienced in Mexico City in the late 1970s pointed to the feasibility of the mode and increased the need for a detailed study.

Discussing this mode with other geographers, it appeared that many cities of the Third World had similar systems. Professor Leemann's knowledge of the widespread use of this mode in Indonesia, highlighted the informal character of these systems, another interesting facet of their spontaneous growth.

Thus, with help from Professor Leemann, with a great deal of practical advice from Dr. Graf in Switzerland and in Mexico and with support from a University of Zurich grant, I was able to study the collective taxi in Mexico City throughout 1981. In Mexico, my work was made easier by contacts from over the last ten years, principally with Ing. Angel Alceda who in 1977 and in 1981 was a valuable adviser.

The main question I hope to raise in this study is whether in European cities we can also benefit from the introduction of the collective taxi mode.

Chapter One: Introduction

1.1 The questions and the hypotheses

The basis of this thesis is the problem of transportation in a growing city. The alternative examined in the case studies presents one method of attacking this problem: a method which does not alone satisfy present urban movement but which can be adapted to complement the networks extant. The transport situation in Mexico City in the 1970s was based on three major transport systems (tram, bus and Metro) serving what would in that decade become the largest urban area in the world (RICHARDSON: 1981, 3). Journeys were extending in the north-east and south-west both in numbers and in the distance travelled. From the late 1960s, however it became obvious that a sector of the population had provided its own answer to the transport problem, firstly in the centre and, by 1972 also in the newer and unserved peripheral regions. This additional transport service was the collective taxi - a saloon car carrying up to five passengers. The service was started to cope with CBD rush hour demand, but had spread throughout the city and throughout the day. In the early 1970s there were almost 4,000 of these vehicles serving Mexico City. The majority of them were registered "taxis colectivos" outside the law but using an official public transport number plate. With increased transport demand during the 1970s private cars began to enter into the transport service: the newspaper EXCELSIOR (17/XI/1972, 27) referred to: "hundreds of private cars carrying out the function of peseros by transporting thousands of residents ... who lack other means of communication." This report made first use of the the term 'tolerado', to describe a private car serving as a collective taxi, and the term 'linea tolerada' to describe an unregistered collective taxi line.

The major growth in this service has taken place in the last decade (1972-1982): collective taxis in the Federal District rose from 3,124 in 1970 (FIGUEROA ALCOCER: 1971, 1) to 10,021 in 1980 (DEPARTAMENTO DE AUTOTRANSPORTES Y ESTACIONAMIENTOS: 1980, 41). 'Tolerados' increased from 86 to 14,971 in the same time span. This enormous growth raises a lot of questions and forms the basis for the three hypotheses of the thesis:

That collective taxis are a Third World phenomenon, that collective taxi systems develop under conditions of rapid urban growth and the resulting increased demand, and thirdly that the system offers a distinctly different service to traditional transport modes and is successful in terms of supply.

1.1.1 Collective taxis are a Third World phenomenon

We felt that only in the Third World had this transport form achieved efficiency. The first area of investigation was therefore into other urban areas to see if the creation of this service was repeated elsewhere. Since collective taxis had had a relatively minor role in transport provision until the 1970s, little work had been completed on their history and formation in Mexico City, thus it was necessary also to trace the development of the system and its present organization and management.

1.1.2 Collective taxi systems depend on increased demand

The collective taxi system is based on the special needs of its passengers and it adapts itself to public demand. Questions arose as to present demand for transport in Mexico City in order to understand why the phenomenal growth had occurred in this sector. Thus we could provide an answer as to what the collective taxi service was offering that allowed such growth to be feasible. Because of their high fares (sometimes five times more than the equivalent journey by bus), we suggest

that the collective taxi is offering something that no other transport form has. It was hypothesised that the collective taxi system has two main characteristics in common with all paratransit systems: firstly that it moulds itself rapidly to public demand and secondly that it "complements rather than competes with" other transport services (SHIATTE: 1976, 204).

1.1.3 The collective taxi supply is distinctly different from other transport modes

There are many aspects in which the collective taxi system differs from the transport supply provided by the bus, underground network or the private car. Its drivers, vehicles, distances and fares are bound by the fact that it is run to make a profit. The widespread supply reflects these circumstances and shows how the system can adapt to changing conditions. This supposes that the collective taxi lines become less favourable with age. These three hypotheses are looked at, respectively, in Chapters 2, 4 and 5.

1.2 A preliminary definition of terms

We must begin by explaining the terms used to describe the transport system we are investigating. The word paratransit is of relatively recent coinage, though it refers to something seen in urban areas since the beginning of this century. This is a collective form of passenger transport which, in type, lies between the private and the public transport spheres. There have been many attempts to describe this word, but the most frequently quoted is KIRBY (1974, 9) who states that: "Paratransit services are those forms of intra-urban passenger transportation which are available to the public, are distinct from conventional transit (scheduled bus and rail) and can operate over the highway and street system." In the case-

studies examined here, this term is used for Mexico City's collective taxis, known locally as peseros or taxis de ruta fija.

The role of paratransit as "a bridge between conventional automobile and conventional transit" (ROOS: 1976, 113), hints at the informality of the service, but the term informal was also included in the title in order to underline the position of Mexico City's collective taxis outside urban law. The service was "recognized" by Mexico City's police department in 1976 (DEPARTAMENTO DE AUTOTRANSPORTES Y ESTACIONAMIENTOS: 1980, 15) but it remains illegal (UNO MAS UNO: 1/VI/1981, 33). Both of these terms will be looked at in greater detail in the literature survey of Chapter 2.

1.3 The present transport supply

To examine the problem of transportation in a growing city, we need to know which transport services already exist. In Mexico City, these are, on the public side, the electric system of trams and trolley-buses, the urban buses and the Metro network, whilst in the private sphere, over 2,000,000 private cars are used daily (COMISION DE VIALIDAD Y TRANSPORTES URBANO: 1981, 1). The use percentages of these different modes are set out in Table 1.

There are 700 trams and trolleybuses (COVITUR: 1981, 11); these are the modern equivalent of the first public transport service in Mexico City. Horse-drawn trams were serving the public as early as 1860 and were formative in the early physical development of the capital (see Section 3.1). The popularity of electric transport diminished after the 1930s with the extension of residential Mexico City away from the original centre around the Zocalo or main plaza (Map 1, C3). The trams and trolleybuses now transport only 2% of the daily load: their share has been halved in the last five years. The 387 kilometres of

Table 1: Transport Modes in the Federal District 1981

Autobus	48 %
Metro	11 %
Taxi and Pesero	13 %
Tram and Trolley	1,8%
Other	<u>3 %</u>
Public	76,8%
Private	32,2%
Total journeys per day = 18.4 million	

Sources: COVITUR: 1981, 6; UNO MAS UNO: 28/V/1981, 27.

track (DEPARTAMENTO DEL DISTRITO FEDERAL: 1976, 3), concentrated in the centre of the Federal District, are expensive to adapt to present conditions. Since the 1970s the tram and trolleybus lines have been re-aligned to co-ordinate with the Metro network, but the service continues to lose in revenue and in passengers due mainly to the age and slowness of the vehicles.

The bus network, which dates from the 1920s, provides Mexico City's most important public transport service. For the last decade nearly 50% of daily journeys have been made using this mode (DGITT: 1977; COVITUR: 1981, 6). Realizing its importance as a key to transport solutions, the government nationalised the service in September of 1981.

At present approximately 8,000 units provide bus service in the Federal District (UNO MAS UNO: 28/V/1981, 1) of which up to 45% can be out of service at the same time (UNO MAS UNO: 13/XII/1981, 32). Until 1981, the bus network had been privately run by small companies tending towards monopolization, and characterized by the Confederation of Mexican Workers as "the cheapest in the world but also the most deficient

and where there occur the most robberies" - the latter refers to robbery by bus companies and by fellow passengers (UNO MAS UNO: 29/V/1981, 1). It is too early to tell whether nationalization will radically alter the picture of overcrowding and undermaintenance in the bus system but the Mexican President stated that: "The transport problems of the Federal District will not be solved during this electoral period" (ending December, 1982) (GOBIERNO DE MEXICO: 1981, Anexo).

The other major public transport service is the Metro, carrying over 3 million passengers daily. An original 3-line network of 42 kilometers was built 1968-1970 and since 1977 has been added to at record construction rates of 2.3 kilometers per month (UNO MAS UNO: 14/XI/1981, 31) (Map 3). By the beginning of 1983 the network covered 110 kilometers with 7 lines. Since its initiation, the Metro network has been extremely popular and fears of the "fatal saturation of the system" were voiced when it reached 1.5 million passengers per day (ULLOA: 1973, 3), repeated in 1977 at 2 million (EL UNIVERSAL: 11/VI/1977, 21) and again at 3.5 million passengers per day (UNO MAS UNO: 4/XII/1981, 35). Passenger numbers have increased on average on the Metro at 11% annually (COVITUR: 1981, 5), a popularity due to the network's speed and its fare. As the only transport mode independent of the capital's crowded road system, the Metro should, and originally did, cut travel speeds (STC: 1973, 5). Overcrowding and over utilisation of the system do now, however, occasion delays and discomfort (ISTME: 1981, 23). Although declared in 1976 as "obsolete years ago" (DGITT: 1976, 4), the Metro fare has remained at one peso since its initiation. Three years after its construction, the Metro was costing its company Sistemas de Transporte Colectivo (STC) 2.2 pesos per passenger (STC: 1975, 5); this cost is now over 5 pesos per one peso fare (ALCEDA: 19/III/1981, private conversation). The low "political" fare remains a major advantage as it can be compared with at least 3 to 3.5 pesos for the buses and trams of the Federal District.

Finally, let us look at the private transport sector. Eighty-five percent of the vehicles on the road (COVITUR: 1981, 12) are private cars, only accounting for, however, under 25% of the journeys made daily. On average 1.8 people travel per car and "30% of the surface available for circulation is used for parking" (COVITUR: 1981, 12). With an annual growth of 11%, the number of cars on the roads will double in seven years (COVITUR: 1981, 2; DGITT: 1976, 11).

To conclude, in Mexico City we see a private transport sector which serves a minority yet uses an inordinate amount of the available infrastructure. 76.8% of the inhabitants travel in public transport and experience congestion and overcrowding (the daily journey to work will be described in more detail in Chapter 4). A great part of the solution would lie in a reversal of these percentages, but the difficulty at present is: providing transport for a carless population whilst the capital continues to grow in numbers and in surface area (ALCEDA: 1975, 11).

1.4 The growing demand for transport in the Capital

1.4.1 Population Growth

The different transport forms described above have all played a part in consolidating the expansion of the capital. The tram was the first important consolidator. During the nineteenth century, it linked areas which had previously housed second homes with the centre, creating the first outer ring of suburbs. Residences were still concentrated around the Zocalo in 1910 (Map 2), and the built up area, covering 4,010 hectares, had a density of 179 residents per hectare - 20% higher than that of 1977 (DIRECCION GENERAL DE PLANEACION: 1977, 1). Steady population growth up to the end of the 1920s gave way to un-

precedented increases - from just over a million inhabitants in 1930 to almost nine million in 1970 (UNIKEL: 1976, 29).

By 1970, the residential land had spread over an area almost ten times that of the city in 1910 and radial communication linked most of the Federal District with the centre (GUIA ROJI: 1970). The basic reasons for this enormous growth were in-migration and natural increase, bound up with the industrialization of the country. Population movement within Mexico began with the internal upheaval and redistribution of lands resulting from 1910-1917 Revolution (ECKSTEIN: 1977, 10), with rural-to-urban and small town-to-urban in-migration concentrating on the capital and the northern border towns. As new roads and railways centered on urban areas after the 1930s, so industrial investment led to employment opportunities, services and housing being heavily biased towards these areas. Migrants made up over 60% of the 1940-1950 urban growth (UNIKEL: 1970, 232). Coupled with this in-migration, natural growth rates rose due to a drop in death rates - from 23.3/1000 in 1939 to 9.4/1000 in 1969 (WARD: 1976, 29). This was particularly noticeable in the capital where the majority of the medical services are concentrated.

1.4.2 Physical Growth

Physical expansion of the capital occurred to house this growing population. Road building increased with the completion in the 1940s of Calzada de Tlalpan and Insurgentes (Map 3, C4 and C1). Industrialization principally took place on the cheaper land of the north and north-east. This led to the building of popular housing in this area which remains one of the transport trouble-spots in terms of overcrowding on buses and supply shortfall. The expansion that occurred in the period 1930-1970 took the city beyond its administrative boundaries in the north, into the State of Mexico (Map 1), with 11 municipios of this neighbouring State becoming officially part of the Metropolitan area from 1970 onwards. The horizontal growth of the period

called for longer journeys to work, and increased demand was mainly catered for with the continued extension of bus lines or the creation of new bus companies. Towards the end of the 1960s, congestion on the narrow central streets convinced planners that more buses simply led to more confusion, and the favourable conditions of a new political regime (SUTHERLAND: 1978, 76) caused the acceptance of an underground system. This system reinforced radial desire lines concentrated upon the centre, while its speed allowed greater distances to be travelled daily.

From the 1950s onwards, the private car had allowed the elite to use residential land further and further from the centre, principally in the south-west. The use of the private car has created middle-class suburbs beyond a radius of 15 kilometers from the Zocalo (for example in Tecamachalco in the State of Mexico) (Map 4). From these suburbs a car is necessary for the daily journey to work. The building of the as yet unfinished inner and outer ring roads (Circuito Interior and Periferico, Map 3, C3 and B4) encouraged as well as lengthened commuting.

A special transport system like the collective taxi was necessary therefore because of the enormous expansion experienced in the capital at this time. This system was established contemporarily with the growth of low income settlements on the city boundaries. The system is unconventional but effective. In the following sector we present our methods of studying this alternative transport mode.

1.5 Fieldwork, methods of study and the thesis layout

Our first experiences of the collective taxi sector were made in 1977, working as a research assistant in the public transport department of the Federal District Council. At this time the collective taxi alternative was underdeveloped and local-

sed. The enormous growth that it later experienced prompted the interest for this study.

The fieldwork for the thesis was carried out in Mexico City from February to December 1981, It falls into two phases. Firstly, until August, the general situation of the citywide collective taxi system was investigated, locating the routes within the urban area (Map 4) and also tabulating information as to route lengths, fares, terminals and personnel involved for the 58 registered routes and 16 "tolerados" (Appendix 1). The information gathering was done from the offices of ISTME (Ingenieria de Sistemas de Transporte Metropolitano), the privately run (by ICA - Ingenieros Civiles Asociados - the builders of the Metro) contract office for transport programmes in the Federal District. Information on three aspects of the system was required - on the automobile used (year, make and owner), on the driver (age, migrant status, working hours) and on the passenger (travel motive, modal split and fare paid). Since an estimated 15,000 cars are working daily (2/3 of the total number available: DEPARTAMENTO DE AUTOTRANSPORTES Y ESTACIONAMIENTOS: 1980, 41), it was decided to take a sample survey: 800 drivers and 8,000 passengers were questioned during two months of fieldwork in the Federal District. The calculations for the sample surveys are in Appendix 2. The questionnaires used were very simple (Appendix 3) and they formed both the source of basic information and the pilot study for the detailed case-studies of the second phase.

With a knowledge of the routes existent and their basic characteristics and differences, it was then possible to pick out three routes to be studied in detail, that is: one established, registered route; one new, registered route and one "tolerado" route. Thus the formation, organisation and management of the three different types of collective taxi routes in Mexico City could be looked at through the case-studies. These three lines are referred to in the text as Route 9.3 (the third branch line of Route 9), Route 1.20 (the twentieth

branch line of Route 1 - the oldest route in the capital), and Route 85. The characteristics of these three routes can be seen in Table 2 and their trajectories are marked on Map 5. The routes themselves were examined by means of three questionnaires (Appendix 3) with, respectively, the route organisers (known as presidentes de la ruta), the drivers and the passengers. In the smaller routes - the 9.3 and the 85 - 50% of the drivers and 10% of the passengers were personally interviewed. These percentages were 25 and 5 respectively for Route 1.20. This gave a total of almost 1,500 questionnaires which were used as the basis of the investigation. Since the questionnaires were conducted directly, it was possible to discard incomplete or confused answer-sheets immediately, doing further questionnaires in order to be left with the desired percentage.

The presidents of the routes were interviewed first - in order to gain permission and recognition for the study and to be introduced to the drivers. The drivers, in turn, were then sympathetic of the questioning of passengers. Because of the acceptance by the presidents, drivers' response was practically 100%. Amongst those passengers asked, approximately 5% could not complete the questionnaire for lack of time and 1% refused to give out information. The final number of 1432 questionnaires represents those completed and analysed. The historical and political background behind present development and future possibilities for the collective taxis was sought out via interviews in the Direccion General de Policia y Transito, the Comision de Vialidad y Transporte Urbano (COVITUR), the Ruta 100 (the government owned bus-lines) and the national newspaper archives.

The following chapter concentrates upon background information and comparisons to be drawn from a literature survey of the spheres of informal and paratransit forms, looking at examples in urban areas generally and in the third world in particular. The third chapter returns to the case of Mexico City and traces the history and development of this particular collective taxi form, describing its present external and internal controls.

Table 2: Characteristics of the case-study routes (September 1981)

Characteristic	9.3	1.20	85
Base terminal	Zaragoza	Toreo	Candelaria
Outward terminal	Colonia Esperanza	Cuemanco	Ozumba
Age of route	12 years	1 1/4 years	1 year
Length	12 km.	33 km.	67 km.
Registered/unregistered	registered	registered	unregistered
No. of drivers	250	800	200
No. of cars	200	500	182
Passengers/day	3,000	8,300	4,000
Maximum fare/passenger	15 pesos	25 pesos	50 pesos
Fare/Km.	1.25 pesos	0.75 pesos	0.74 pesos

Source: Interview with Route presidents.

The fourth chapter looks both generally, and with the results from the case-studies as examples, at the service offered by the collective taxis and outlines the demands arising from the daily journey to work in the Mexican metropolitan area. In the fifth chapter the supply is analysed by means of the case-studies and we look at the degree of public satisfaction with the sector. A final chapter draws conclusions as to the relative advantages to be gained from the use of collective taxis, both in Mexico City and for other urban areas, looking at future possibilities and the setting up of an efficient paratransit network.

Chapter Two: A Background Survey of Informal and Paratransit Forms

2.1 Jitneys and Paratransit in the United States and Great Britain

2.1.1 The origins of the jitney movement

Like the motor car, the first jitney or collective taxi also originated in the United States. 'Jitney' means 'nickel' (ROSENBLOOM: 1970, 48), the five cent fare which each passenger originally paid. The collective taxi mode is almost as old as the motor car itself: it is revealing to note that "paratransit has been in existence for 50 to 60 years but we just didn't have a name for it" (GALLACHER: 1976, 122). In fact, we are examining a transport mode that first appeared in 1914 - the jitney movement is customarily said to date from July 1st of that year when a Model T owner in Los Angeles picked up a passenger and accepted a nickel as payment (ECKERT and HILTON: 1972, 294). A major question is therefore, why, having been successfully innovated - and the number of jitneys grew to a peak of 62,000 in United States' cities in May 1915 - does this form of transit no longer operate in the major urban centres¹⁾? The question is particularly relevant when one realises that United States' transport specialists are basing current research on just such a paratransit mode - GRAVA (1972, 465), describing the jitney system of Manila, calls it a "ready-made, demand activated mass transit system for which the search continues in the United States".

ECKERT and HILTON's article describes how the jitney service grew in Los Angeles throughout 1914, helped by the unemploy-

1) Only San Francisco and Atlantic City have official collective taxi routes working on the jitney principle (ROSENBLOOM: 1971, 8).

ment resulting from World War One and by the diffuse pattern of Los Angeles' growth. The system afforded direct competition to the street railways which had previously moved 90% of the demand and which also ran on a flat nickel fare. By December 1914, the street railway system was losing 600 dollars a day to the jitneys. The jitney movement spread to San Francisco and beyond California: Dallas did not have one jitney on January 1st 1915, but by March of that year 259 were in operation. Notable is the fact that the jitneys' gross revenue from 1914 to 1915 was uniformly in excess of the street railways loss of revenue: the jitney system increased public transport movement, taking passengers from the taxis or from the group which had previously journeyed on foot. The services offered by the jitney, which included door-to-door routeing, parcel delivery and sometimes total flexibility of route and schedule, were self regulating and immediately responsive to demand conditions. Some drivers provided the first example of a car-pool by posting their place of work on the car window and picking up passengers along the way. With standees on the running boards, as many as 14 people could be transported and by early 1915, the street railways had realised that the innovative jitney would not just disappear.

American street railway companies therefore turned to municipal governments for protection and within a year regulations had been introduced that virtually killed the collective taxi mode. Weak politically, the jitneys were opposed by shopkeepers who benefitted from street car routes, by electricity companies which provided the street car's power, by town halls which received franchise benefits from street car companies, and were disadvantaged by a noted rise in traffic accidents; the jitney movement stood no chance against the type of regulations introduced. These were in part pure common sense, for example the need to obtain insurance bonds and licences, and the imposition of speed limits, but they were also used as weapons against the jitney movement, for example regulations which lengthened the minimum hours of operation, disallowed

deviations from routes and excluded jitneys from the downtown area. In the main, these regulations were formulated so as to reduce the jitneys' inherent advantages of adaptation to peak hour demands and of flexibility of supply. The enormous bonds required for insurancing and the long uneconomic routes enforced limited the system further - Philadelphia experienced a drop in jitney numbers from 1,200 to eight overnight; Los Angeles, with 1,000 in operation in 1916, had 32 jitneys in 1917 - by 1920, jitneys had virtually disappeared.

ECKERT and HILTON have stated that the anti-jitney regulations are responsible in part for present transportation problems in urban areas. Characteristics such as the inflexibility of bus routes, the high price of taxi services and the incentive towards private car use are, they feel, direct results of the banning of the jitney movement. Their article concludes that the jitney system was politically rather than economically unworkable, and that "both the investment in automobiles and the vehicle counts on roads in rush hours are generally in excess of what they would be if the jitneys had not been prohibited" (ECKERT and HILTON: 1972, 324).

2.1.2 Present day paratransit in the United States

Fifty years after regulating the collective taxi out of business, United States' urban governments, faced with the 1973 oil crisis and a continuing fall in public transport use, began to study what they termed 'paratransit'. Before this, especially in the 1960s, urban transport specialists had championed mass rapid transit, in particular the underground (with BART as the prime example), to keep public transport in business. Most research had centered upon innovative RPT - rapid personal transit. However, in December 1973, Federal legislation provided funds for a car pool programme and in 1974, KIRBY's classic 'Paratransit: Neglected Options for Urban Mobility' was published.

What then do present urban transport researchers mean by paratransit? Following on from the description by KIRBY, quoted in Chapter One, a 'State of the art overview' (KIRBY: 1976, 37) describes paratransit as covering four types of service: the taxi, both demand-responsive and jitney; the rental vehicle, short term or on a daily basis; the subscription bus on a regular basis; and the home-to-work car pool. Unifying factors are: some degree of formal organisation plus flexible routing to serve specific rider origins and destinations rather than simply high demand corridors (ALTSHULER: 1976, 90). According to CASE and LATCHFORD (1981, 3), paratransit is a type of semi-public service rather than one which uses a particular type of vehicle, and is individually priced depending on distance. The system is flexible and demand-responsive and based on any mode from the hand-cart to the conventional bus. ROOS (1976b, 5) explains that the present paratransit sector in the United States is "fragmented, unco-ordinated and unorganised."

Paratransit services can be divided into two principal areas - prearranged ride sharing which includes car and van pools, and dynamic ride sharing which means the shared taxi (see Table 3). Let us first look at pooling: most paratransit experiments in the United States have been limited to this system. This area has not met with great success: in May 1976, the Federal Energy Administration reported that petrol consumption had almost risen back to its peak level of August 1973, before the car pool funding programme (KURTH and HOOD: 1976, 49). BRUGGEMAN and RUBIN (1976, 40) found that "by far the greatest number of car-pools contain only two occupants", and car and van pool programmes have had little impact on peak hour vehicle occupancy (KORNHAUSER, MOTTOLA and STEPHENSON: 1976, 44). A depressing example is quoted by KURTH and HOOD (1976, 50): the urban government of Cincinnati began a data processing organisation in late 1973 designed to match citizens interested in car-pooling - after a year, there had been only 100 responses and none of them could be matched.

Table 3: Comparison of several types of paratransit in urban areas

	Name	Route	Stops	Schedule	Booking	Fare	Capacity	Radio Communication	Occurrence	Viability	Legal	Comments
a 1	Dial-a-Bus	variable	on demand	variable	yes	individual	30-40	yes	US; GB	poor	yes	door-to-door
a 2	Community Minibus	fixed	fixed?	fixed	yes	individual	12-30	no	US; GB	good?	yes	locally organized, volunteer drivers
a 3	Diverting Conventional Bus	semi-variable	on demand	variable	yes	individual	40-80	no	GB	better than conv. bus	yes	suited to inter-urban routes
a 4	Subscription Bus	according to demand	on demand	fixed (peak hours)	yes	individual (season tickets)	40-80	no	US; GB	good	yes	
a 5	Carpool	fixed	fixed	fixed	yes	petrol sharing?	2-5	no	US; GB; Australia	good	yes	door-to-door Also van-pool
b 6	Shared taxi	variable	on demand	none	no	shared fare	4-6	yes	Washington D.C.; Most major air ports	good	yes	door-to-door
b 7	Jitneys	semi-variable	on demand	none	no	flat fare (can vary with distance)	4-6	no	Atlantic City; San Francisco; Indian Cities, Latin America; Capital; Philippines	good	no	this thesis' case-study
b 8	Minibus	fixed	on demand	none	no	flat fare (can vary with distance)	12-30	no	Jamaica, Peru, Malaysia, Thailand, GB	Third World: good; GB: poor	yes	
b 9	Rickshaw	variable	on demand	none	no	individual	1-3	no	Indonesia, India	very labour intensive	no	some still non-motorised

a = pre-arranged paratransit; b = dynamic paratransit.

Source: Transport and Road Research Laboratory: 1976, 3, and own observations.

It is, however, the second or dynamic type of paratransit that we are studying in Mexico City and are interested in examining with regard to other urban areas. There have been examples of this mode being implemented in the United States and Great Britain, although as yet on a small scale, and we would like to look at these examples before moving on to the more detailed cases of Third World cities.

2.1.3 Shared Taxi and Dial-a-ride in the United States and Great Britain

To begin with the United States: the LEA Compendium study of 1974 (LEA TRANSIT: 1974) mentions the two remaining jitney services of Atlantic City and San Francisco, plus the shared taxi systems of Davenport in Iowa, Hicksville in New York State and Madison in Wisconsin. The two jitney services are based on the original fixed route²⁾, flat fare organisation, while in Davenport the service is requested by telephone. The latter moves 28 people per kilometer per day and the jitney in Atlantic City moves 8,002 passengers per kilometer per day. Since 1974, dial-a-ride and shared taxi experiments have spread. There are examples of dial-a-ride services on a small scale in El Cajon, California, arising out of a partnership between the local government and the local taxi company (ORSKI: 1976, 22), and on a larger scale in Toronto, Ann Arbor and Rochester, where scheduling and dispatching is now automated. The Ann Arbor operation in particular has had some success in taking journeys away from the private sector: "60% of the trips eliminated the need for an automobile trip (either driving or riding)" (DRAKE: 1976, 22).

Also important is the system at Union station in Washington D.C., the only major urban area in the United States in which shared-ride taxi regulations have been enacted to date. The system is a dynamic ride sharing operation and results show the morning

2) Atlantic City's jitneys serve Pacific Avenue whilst those of San Francisco travel up and down Mission and Third Streets.

peak hour traffic being moved with 60% fewer taxis, as well as with lowered fares since the cost is distributed amongst the passengers (KORNHAUSER, MOTTOLA and STEPHENSON: 1976, 48). In this system, because of the necessity of maintaining activities in the CBD, mass transit has been co-ordinated with paratransit. A similar example is that of Peterboro, Ontario, where the city has assumed control of a 'feeder' system bringing dispersed riders into the radius of conventional mass transit, making it part of regular service operations. The local government provides a share of the operating subsidy (MILLER: 1977, 2). BERS and JONES (1976, 25) feel that the most promising new developments in the paratransit field have been generated by new town residents, and they cite the example of Reston, Virginia which has developed a subscription bus service. The service consists of 25 vehicles carrying 1,800 people per day to and from downtown Washington D.C. We shall see the entrepreneurship of new city residents echoed in Mexico City in Section 3.4.

The overall picture in the United States is mainly small scale - even the well equipped Ann Arbor service caters for only three to four percent of the community (TRANSPORT AND ROAD RESEARCH LABORATORY: 1976, 10) - especially when compared with paratransit services in Third World metropolises such as Manila, Calcutta and Mexico City. Many of the United States' systems are small scale precisely because of the regulations passed 1917-1920: restrictive laws with no present relevance. ROOS (1976b, 6) stresses that many existing paratransit services are illegal if the obsolete regulations are enforced. ROSENBLUM (1971, 8) mentions an illegal jitney service in Chicago "operating for many years in the black ghetto although officially denied". In 1972, LEE, FALOCCHIO and CANTILLI (1972) commented on the illegality of non-medallion cabs in New York City: these are usually carrying, and driven by, members of minority groups. The importance of poorer and minority group sectors amongst ridership is a further characteristic of the service: ALTSHULER (1975, 93) points to the fact that persons with a family income under 5,000 dollars per year constituted 16% of the population but accounted for 25% of the taxi patronage. Also

the flexibility of the service is vital to those areas where few households are car owners. Few dial-a-ride services, however, benefit the car-less population and current regulations work against the expansion of this type of public system: as late as 1965 (US DEPARTMENT OF TRANSPORTATION: 1973, 9) a jitney service in St. Louis was legislated out of existence.

Unfortunately, Great Britain, where such stringent regulations have never been necessary, shows equally few wide-scale experiments of the shared taxi and dial-a-ride sort. The Transport and Road Research Laboratory conducted a symposium on unconventional bus services (TRANSPORT AND ROAD RESEARCH LABORATORY: 1976) and investigated systems in Harlow, Hampstead Garden Suburb, Sale (a suburb of Manchester), Milton Keynes and Dorridge (a suburb of Solihull). The last mentioned was begun in December 1975 as a dial-a-bus service and attracts the majority (60%) of its users from conventional busriders or walkers (MITCHELL: 1976, 5). In Harlow and Solihull the rate of diversion of trips from private cars is about 1/2% driver trips and 2 1/2% passenger trips: depressing figures for the advocates of public over private transport. The Transport and Road Research Laboratory symposium concludes that there is a need for work on taxis and jitneys in the urban areas of Britain and for demand-responsive systems with bus diversion in rural areas. Both the United States and Great Britain have experimented far less with paratransit than the Third World cities that we shall look at in the rest of this chapter.

2.2 Informal transport in South East Asia and India

2.2.1 The term 'informal'

The Third World is far in advance of Great Britain and the United States in the provision of what has been called the para-transit or collective taxi mode. This transport form is also described as 'informal' (RIMMER, DRAKAKIS-SMITH and McGEE: 1978, 8), particularly with reference to the Third World. The term is basically interchangeable with 'intermediate' (FOURACRE: 1979, 4), with 'protoproletariat' (McGEE: 1976, 7), with 'unincorporated' (DICK: 1981a, 78 footnote) and with 'marginal' (PEATIE: 1980, 1). This transport form is frequently outside the law and it is usually "not only unorganized but also unregulated, not yet subject to government control" (DICK: 1981b, 74). The numbers of people moved by this sector are high: 58% of all motorised trips in Calcutta, 48% in Bombay (FOURACRE: 1977, 3), and 69% of all journeys in Manila (BOVY: 1976, 4.22). There is a wide range of vehicles in the informal transport sector in Third World cities, including non-motorised modes such as the rickshaws of Chiang Mai (FOURACRE: 1979, 2) and the becak (pedicab) of Indonesia (DICK: 1981a, 66). The word informal carries with it, particularly for those urban governments trying to control private initiative in transport, the idea of underdeveloped, poor-man's technology (RIMMER, DRAKAKIS-SMITH and McGEE: 1978, 190): urban planners are frequently embarrassed by the sector's air of improvisation and poverty (GRAVA: 1972, 482). In fact, one must not underestimate the degree of sophistication and development in this sector (see PEATIE: 1980). BOWES (1970, 288) actually sees the demand responsive transport form as an answer to the problems of unsatisfactory planning.

Further characteristics are the use of small scale, labour intensive technology, vital to cities with high growth rates and

high unemployment. Also important in this sector are high fares, offset by greater flexibility and thus higher average occupancy rates. Large numbers of vehicles are used, operated by drivers who work irregular hours and have no regular wage, no or almost no governmental aid but direct interpersonal relations with the clientele (McGEE: 1976, 12). SETHURMAN's study (1976, 69-81) of the urban informal sector lists the factors basic to the informal industry as being: ease of entry, indigenous resources, small-scale operation, use of skills acquired outside the formal schooling system and competitive markets. These factors can be used to describe the outlines of all informal paratransit systems of Third World cities. Briefly, we can define the transport of the informal sector as mainly outside government control and concentrating upon a back-up of present networks. The operation is flexible, small-scale, irregular and competitive; it is privately owned usually and therefore run to make a profit.

2.2.2 Informal transport forms in South East Asia and India

Informal public transport forms are widespread in urban Asia and the major examples studied are Manila (GRAVA: 1972), Jakarta and Surabaya in Indonesia (DICK: 1981a, 1981b), Kuala Lumpur (EASTMAN and PICKERING, 1981), Chiang Mai in Thailand (FOURACRE: 1977) and Hong Kong (LEA TRANSIT: 1974).

In Manila, for example, is one of the first paratransit forms to be studied in detail and one of the most extensive systems. The form is known as a 'jeepney' (jeep plus jitney). In 1980, there were almost 17,000 jeepneys in operation. This transport mode arose soon after the Second World War when migrants moving into the Philippinan capital increased the need for employment and daily travel. Jeeps left behind by the American army were bought up for the transport sector and in 1980 coped with 69% of commuter travel. The number of jeepneys has grown steadily since the war with vehicles now imported from

Japan. The use of jeeps was originally meant as a stopgap until the war-destroyed transport system could be re-built. In fact the success of the system has led to continued use and there are now 135 seats per thousand inhabitants (Table 4). Headways are as low as three seconds. Like the majority of collective taxis in Third World cities, the jeepney is privately owned and can be rented for the week or month - few collective taxis in Manila are owner driven - with the driver paying for oil, petrol and a daily quota. The system is based on set routes but these are flexible in terms of demand or traffic hold-ups. The cars usually hold 10 to 14 passengers though up to 25 passengers have been noted in rush hours (BRUCKENBAUER: 1980, 1): again like most Third World transport forms they are predominantly disorganised and dangerous. Though originally set up to complement the system, jeepneys operate in direct competition to the Manilan buses. Collective taxis are, as a rule, faster and more expensive than buses. In Manila, however, the fare difference, and consequently the difference in social status between the two modes, is negligible. Each jeepney can well accommodate 1,500 person kilometers during a 10-hour day, leaving the driver and the owner better paid than many of their passengers (GRAVA: 1972, 480). The system as a whole is widely criticised by government, bus companies, planners and car owners, but very popular with the public: this situation is echoed in most of the Third World urban areas where paratransit forms operate.

In South East Asia's largest urban area, Jakarta, the informal transport sector is also important. Indonesia's capital and its second largest city, Surabaya, still have examples of non-motorised collective transit though these have virtually disappeared in favour of the three-wheel 'bemo' and four-wheel 'opelet'. The Indonesian paratransit forms again show greater flexibility and frequency than the local unpopular and overcrowded bus service, though the latter is cheaper through subsidisation. Collective informal modes of transport appeared here earlier than in Manila: DICK (1981a, 69) mentions jitney routes running parallel

Table 4: Characteristics of collective taxi systems in four Third World capitals

City	BEIRUT	MANILA	CARACAS	MEXICO
Name of System	Service	Jeepney	Por Puesto	Pesero
No. of collective taxis (1970) (1980)	2,000 no service	14,900 17,000	6,000 7,000	3,200 25,000
Population (1970) (1980)	600,000 3,000,000	1,400,000 8,000,000*	2,058,000 4,000,000	6,874,000 9,000,000**
Collective taxi seats/ 1000 inhabitants (1970)	17	135	16	2.3
Autobus seats/ 1000 inhabitants (1970)	2.3	0.9	0.6	1.3
% growth of collective taxi system 1970-1980	-	14	16	680
km/day/car	120	150-190	100-115	200-250
maximum no. passenger/car	5	12-14	5-6	5-6 Combi: 9-11
% total transport demand filled daily (1970)	33	69	16	3
* Metropolitan Manila. ** Distrito Federal.				

Source: BOVY: 1976, 4.22.

to tramways in the 1930s but numbers increased as Japanese and American jeeps became available. In the 1950s and 1960s, the number of Opelet in Jakarta grew rapidly to compensate for the removal of the tramway system and the inability of the bus fleet to cope. Again we see public preference and government disapproval even though the system is legal in Surabaya, where 54% of trips are now made in autorickshaws and 39% in minibuses

leaving only 7% to conventional buses and private transport (JACOBS, FOURACRE and MAUNDER: 1982, 5). DICK (1981b, 84) concludes:

"Despite the government's conviction that public transport is too important to be left to the private sector, the fact is that jitneys have survived all the vicissitudes of transport policy for fifty years and provided a much more continuous and reliable service than any public enterprise."

In Malaysia's Kuala Lumpur the collective paratransit is distinctive in that it consists principally of 400 government-run minibuses, introduced in 1975, working in competition with 440 conventional buses. Once more, the higher fares in minibuses do not affect their popularity: EASTMAN and PICKERING study of Kuala Lumpur (1981, 8) states: "relatively few travellers considered that the level of fares was a major cause for concern". Minibus numbers are increasing (by 100% 1976 to 1978) and they carry approximately 500 passengers per day.

The paratransit of Chiang Mai, Thailand's second city, has a number of distinctive characteristics. The system is legal, 90% owner driven and consists of minibuses operating flexible routes with an average headway of 23 seconds throughout the day (FOURACRE: 1977, 9).

Minibuses also operate in Hong Kong where 20 to 25% of all trips are made in paratransit modes. There is a total of 38,000 vehicles, privately owned but government regulated. These also operate on fixed routes but with no schedule, making 16,000 trips per day and a consistent profit (LEA COMPENDIUM: 1974).

Urban areas of India use a wide variation of transport modes including cheap, individualised transportation such as cycle rickshaws and handrickshaws. The paratransit forms cater for at least 30% of the transport demand in Indian cities (MAUNDER, FOURACRE, PATHAK and RAO: 1981, 4) and they make up for the

shortfall in conventional buses: there are only 30 seats per 1000 inhabitants on average in India (JACOBS, FOURACRE and MAUNDER: 1982, 3). Calcutta, as the only city of its size in the world without a rapid transit system, has 58% of motorised trips in the informal mode sector. This city has experienced a steady growth in minibus numbers as these vehicles provide the best frequencies, speeds and headways.

Urban public transport in all the cities mentioned above is a growing industry. The existence of an open market has allowed the more flexible, demand-related informal modes to compete and develop. The majority are profit making and widely used.

2.3 Collective taxis in Africa, Latin America and the Mediterranean

2.3.1 The collective taxi

The pattern of paratransit modes seen in Asia is repeated with the exception that there are no rickshaws: collective taxis are the norm. These systems are based on traditional taxi operations but carry more than one passenger to a fixed destination. They mainly use the American saloon car and prices are either fixed or shared between passengers. Before examining African examples we would like to look at two important examples in the Mediterranean: in Istanbul and Beirut.

2.3.2 Two Mediterranean examples

The Istanbul paratransit vehicles are called Dolmus and are old American estate cars. Their average age is estimated to be over ten years but there is a trend now to smaller newer and locally produced vehicles. Thus the official number plate that these vehicles carry can be worth more than the car it-

self. The 16,000 Dolmus run on fixed and short routes and carry 13% of Istanbul's daily load. The number of vehicles has increased steadily since their introduction in the 1950s, gaining ground from the conventional bus and trolley systems. Increased demand has led to the introduction of minibuses too. Local politicians feel that these two paratransit modes cause a large percentage of the congestion of Istanbul's streets, but since these are the dominant means of public transport, any government limitation of them leads to public protest (OZDIRIM: 1973, 68).

Though no longer existent due to the present war conditions, Beirut had a paratransit service which could carry 33% of the daily load (Table 4), with just 2% of the vehicle mass (BOVY: 1976, 2.57). Again cars were predominantly American saloons and not a few of them had over a million kilometers on the clock (FARMER: 1967, 220). The system worked as with most others, by hailing where there is less traffic; where more, passengers made groups at known but unmarked spots on the sidewalk. These cars were faster and more expensive than the buses - FARMER (1967, 224) quotes a fare 60% higher than on the buses. He adds:

"The author rarely had to wait more than two or three minutes when going downtown on one of the busier routes at any time of the day or night (and what American city could match that service?)."

2.3.3 African paratransit

In Africa few paratransit systems have been studied in detail. There is mention of the open trucks of Addis Ababa (ENGLEBRECHT: 1966, 132) and the "Kai-kais" of Nigeria (BOVY: 1976, 2.57). The latter total 3,500 including legal and illegal vehicles (LEA TRANSIT: 1974) and they carry 900,000 passengers (plus animals) per day. Nigeria's accident rate is the highest in the world - with 234 people killed per 10,000 vehicles as

compared to three per 10,000 vehicles in Great Britain (OBSERVER: 1982, 12). Apart from these examples, little is known of the un-incorporated paratransit methods that are probably used all over the continent.

2.3.4 Latin America in general

Since our case-study is based on Mexico City, it is particularly interesting to look at collective taxis in other parts of Latin America and in the West Indies. We describe the paratransit systems of Trinidad and Kingston in the West Indies and of Lima and Caracas in South America.

Trinidad has 6,000 5-seater vehicles which stop on demand and operate as a collective mode. Twenty percent of these vehicles are illegal (LEA TRANSIT: 1974) but as the service is good, providing ten second headways in peak hours, it is not closely controlled by the government. In neighbouring Kingston, the paratransit system is formed of 1,250 Volkswagen minibuses carrying eight to ten passengers, plus a few Ford Transit trucks carrying 18 to 20. Here, too, a large number of the vehicles are illegal. The local bus company is nationalized but suffers from a decline in patronage and a severe shortage of vehicles - because this service is so bad, the minibus industry has developed rapidly, often on the same routes as the conventional bus. A 1977 survey of the city found that 88% of households in Kingston had a regular minibus service within 330 meters. The service is unusually well protected by insurance: most of the Jamaican Minibus Association drivers (whether licensed or not) carry insurance to a greater or lesser extent, at least sufficient to protect the passengers in the event of an accident (HERATY: 1980, 7). The minibuses in Kingston meet the needs of the urban poor because they operate in areas where bus services are severely overcrowded and irregular.

Lima's inhabitants benefit from two paratransit systems: there are 7,000 minibuses or "cooperativos" run by over 100 private

Companies as well as the "colectivos" or collective taxis, again privately owned (NEUE ZÜRCHER ZEITUNG: 1981, 8). Only a fraction of the urban movement is on the publically controlled buses (LAURIEN: 1966, 59). The two paratransit systems have fixed routes and definite stops where LAURIEN (1966, 60) noted long but disciplined queues.

In Caracas the paratransit vehicles, called 'por puesto' jitneys, again form "the mainstay of movement in the city" (TURNER: 1970, 58). These jitneys are 5-seater saloons (Table 4) with speeds virtually identical to those obtained by the private car (KUDLICK: 1969, 44). Each route has a fixed destination though the route itself may be flexible. TURNER (1970, 58-59) calls them a rough and ready type of service but he insists that:

"Even with competing lines, lack of co-ordination and no public relations, these cars do a surprisingly good job and are probably the forerunners of future transport when it is eventually accepted that small public vehicles can give a more efficient, more widespread service than either large buses or trams, at least in central city areas."

Further examples of these systems can be seen in the world survey (Map 6) of paratransit forms.

2.4 A synthesis and appreciation of present forms

The widespread use of the collective taxi or minibus, in particular in Third World urban areas, seems to validate the conclusions that TURNER gives in the above paragraph. It is helpful, before looking at the detailed history of the Mexico City case-study, to itemize the characteristics of present paratransit forms (Table 3) and to look at the advantages and disadvantages of the systems we have described.

We can isolate six basic characteristics which portray the advantages of the sector and which are true to a greater or lesser

ser degree in all the above-mentioned systems. These are firstly: the seeming contradiction of vehicle flexibility on a fixed route. The vehicle nearly always has a fixed destination, but it is flexible in that it can deviate to avoid traffic holdups and also in that the route can be changed easily as land-use conditions change. This flexibility is particularly important in the rapidly growing capitals of the Third World - JAMIESON (1976, 123) underlines the importance of this characteristic when compared with the fixed mass transit programmes of the 1960s, commenting: "You cannot chase urban sprawl with a bus or rail system as it moves outwards - it is too costly." It is also, in the case of the Third World cities cited above, too late - by the time a Metro line has been extended, the physical boundaries of the city have moved further outwards.

The second characteristic which is also a type of flexibility, is the lack of schedule. The enormous amount of vehicles involved makes for low headways, and the possibility of hailing or telephoning for the service from any where means that a rigid schedule is not necessary.

Thirdly, ownership of the vehicles is predominantly private. There are some government bus schemes, particularly in the United States, but the paratransit systems of the Third World are mostly outside the public sector and sometimes even outside the law.

A fourth characteristic is cost. The collective taxis and minibuses are nearly always more expensive than government run conventional buses. The conventional systems are subsidised, with fares held stable as a social benefit. This can lead, however, to a lack of funds with which to maintain and regenerate the service: overcrowded buses and outdated vehicles are the result even when subsidisation is as high as 60% as it is in some Indian cities. Fare increases for conventional transit are often out of date by the time they are granted but paratransit sector fares usually rise to keep pace with inflation.

The fifth characteristic explains why the public is willing to pay the higher fare of the paratransit service - the advantage of speed. In Indian cities, for example, where streets are congested with cycle rickshaws, pedestrians, street traders and handcarts, the speed of conventional buses can be reduced to 5 km/h: under such conditions it is a struggle to achieve economically viable utilization from a large vehicle. The smaller paratransit vehicles move faster through congested urban traffic, have consequently lower headways and, since drivers are working in competition with each other in a profit-making activity, the demand for vehicles is closer to being filled than in the public sector. To conclude: the public pays more for the faster, more comfortable and more readily available service of the informal or paratransit sector.

The sixth characteristicsitic is a social aspect. Apart from flexibility, adaptability to the market, speed and comfort, the paratransit service has a role as a job provider. In some Third World cities, 10-20% of the economically active population is involved in some kind of informal transport activity (JACOBS, FOURACRE and MAUNDER: 1982, 6), and GOULD's (1965, 24-47) study of rickshaw drivers in India points out the importance of paratransit as a means of employment. He emphasises the lack of training or education necessary and the attractiveness of the sector for the recently arrived rural migrant. Admittedly few paratransit drivers in the Third World are protected by labour legislation. The drivers do enjoy mobility, combined with a "reasonably good wage" (GRAVA: 1972, 479)³⁾. HERATY (1980, 15) calculated that 6,000 of Kingston's 660,000 population were dependent upon the minibuses for their livelihood.

There are also distinct disadvantages in the paratransit systems described. The first problem is that of careless driving and accidents. These occur where drivers jostle for custom. Inhe-

3) "Minibus drivers' wages plus bonuses are estimated to be about 25% higher than the remuneration for a comparable stage bus driver" (JAMIESON, MACKAY and PARTNERS: 1981, 7).

rent in the way in which these services operate is the competition between drivers. There is a certain amount of control of loading at terminal points (see Section 3.7), but once on the route, drivers move quickly and stop without warning if hailed. When the collective taxi or minibus is full, it benefits the driver to arrive at his destination as soon as possible, in order to pick up new passengers. At present the sector is responsible for a large percentage of urban traffic accidents. OZDIRIM (1973, 68) says that the Dolmus of Turkey is the cause of almost half of all urban traffic accidents per year, whilst ECKERT and HILTON (1972, 307) gave accidents as one of the major complaints against the United States' jitney movement. If adequate insurance were required, and paid out, passengers could be recompensed, but the present operation of the system, where each driver earns what he can rather than being paid a wage, does not make for careful driving.

One of the major reasons why the informal transport sector is so important, is the large number of vehicles in use (JACOBS, FOURACRE and MAUNDER: 1982, 6); this leads, however, to the problem of congestion. In many of the Third World cities cited, congestion is principally caused by private transport: in Mexico City for example, over 80% of the traffic - 2 million vehicles - is private cars. Already congested streets are worsened therefore by the addition of many small vehicles acting as collective taxis. The paratransit modes hold fewer passengers than conventional buses: approximately eight saloon cars are needed to carry the equivalent number of seated passengers as a bus.

The last problem concerns the status or image afforded these paratransit modes by transport planners and politicians of the Third World. The Rickshaw, Dolmus, Jeepney and Opelet vehicles are all being phased out by their country's urban governments because of the modes' stigma as an underdeveloped or 'peasant' technology (RIMMER, DRAKAKIS-SMITH and McGEE: 1978, 190). Certainly a new, electronically controlled Metro network looks politically, economically and environmentally superior. An

underground system can also carry far more passengers and remain unaffected by congestion. Almost all the systems described are publically appreciated but politically disliked.

We can sum up this overview of paratransit modes by enumerating the characteristics of speed, flexibility and an adaptability to demand. These modes have a loosely regulated, sometimes entrepreneurial nature, enlarging transport supply by providing a degree of personal accommodation and ease of access that is not available from conventional public transport. Some characteristics such as irregular hours, an irregular wage, lack of passenger protection and complete illegality are relevant mainly to these modes in Third World cities. Paratransit forms have sprung up to serve needs not met by traditional transit facilities, but their methods of operation have also led to congestion, accidents and anarchic growth. The picture we are left with is one of the paratransit mode as a community service, with both the spatial limitations and the social benefits that this term conveys.

Chapter Three: The Collective Taxi in Mexico City - its History and Present Organization

3.1 1860-1940: The creation of a public transport system

As we have seen in Chapter One, the collective taxi is only one of the five public transport modes at present available in Mexico City. Organised public transport in the capital dates from the 1860s when mule-drawn trams were introduced. The first of these tramlines was set up in 1856 with a regular service from the Cathedral to the western city boundary (EL NACIONAL: 26/V/1969, suplemento especial). The tramlines were electrified in the 1890s and became public in 1900 under the Mexican Tram Company. The network began to link up outlying villages such as Coyoacan, Mixcoac and Tacuba (Map 1) with the centre, creating the first suburbs.

The second step in the history of public transport came with the creation of the bus fleet in 1916 (ALCEDA: 1975, 2). This service developed spontaneously when an electricity strike halted the trams. Thus the bus service arose without technical orientation or planning. The first buses - originally taxi cabs fitted with wooden seats capable of holding eight to ten passengers - travelled mainly on tram routes in the centre. When the strike was settled, buses continued to be used due to their low price and due to the rising transport demand (EL NACIONAL: 29/V/1969, suplemento especial). Since this period, though trams are still used in Mexico City, they have not regained the importance enjoyed in the early 1900s. However, the contribution of the electric trams to the physical layout of central Mexico City was great - city growth at this time was shaped by transit lines (SCHAEFER and SCLAR: 1975, 18-33).

The number of bus routes increased steadily - 25 lines in 1925, 30 in 1929 and 45 in 1940 -, following, rather than

forming, new centres of growth. Originally, bus drivers operated individually, but, in order to eliminate competition between vehicles, the Busdrivers Alliance (Alianza de Camioneros) was founded in 1924 (REYES RIOS: 1963, 40), and it remained until the service was nationalised in 1981. The spontaneous creation of the bus service and its continued growth have meant that routeing and expansion has been unplanned with, for example, more than 75% of the routes passing through the centre (INGENIEROS CIVILES ASOCIADOS: 1967, 11).

Private cars and taxis had also been on the streets of Mexico City since the early 1920s. Due to the inability of trams and buses to move quickly and to a regular timetable, and due to the status involved, all those who could, bought private cars: thus the congestion worsened. Taxi cabs had been in existence since the beginning of the twentieth century and in 1929 there were 25 ranks, each with 15 to 30 vehicles (EL NACIONAL: 29/V/1969, suplemento especial). The cabs were grouped in fleets under one owner: "There were those, around 1935-1940, who owned between 100 and 200 vehicles" (EL NACIONAL: 29/V/1969, suplemento especial). The number of cabs increased from 1930 to 1940 at about 700 per year.

3.2 1940-1950: The rapid growth of transport demand

From 1940-1950, the population of Mexico City increased by 1,3 million (UNIKEL: 1976, 29) and, since expansion was horizontal rather than vertical, the capital spread over an area, by 1946, of 250 sq kms (BEAUJEU-GARNIER: 1967, 2). Thus the transport demand profile consisted of higher numbers travelling longer journeys. New urban highways, for example the Calzada de Tlalpan, Avenida Insurgentes and Viaducto Miguel Aleman (Map 3, C3, C1 and D3) were built in this decade, serving but also stimulating auto traffic. During this decade, political considerations also affected the population pattern

and they promoted rural to urban migration. These conditions were: the weighting of industry over agriculture in the economy, the promotion of capitalism which concentrated the workforce on the capital and, lastly, the mobility of the population due to improved internal communications and the upheaval of the Second World War. Thus, industry expanded to the north east of the Zocalo where land was cheapest and commercial activity extended south down Insurgentes away from the centre. Housing was needed throughout the capital, and residential areas began to extend into the neighbouring State of Mexico - richer areas to the west and poorer to the east of the city.

Plans for an underground railway, first aired in the 1930s (SUTHERLAND: 1978, 76), were shelved due to lack of funds, and the expansion of transport supply to cope with the increased demand was concentrated upon the buses. In 1950, the government decided to introduce first and second class buses, to attract car-owners to the dearer first class vehicle. The latter were used buses, imported from the United States, whilst the second class buses were those already in use in the Federal District (EL DIA: 21/V/1977, 14). Meanwhile, growth in population, increasing distances to be covered, and industrial and economic expansion pointed towards the need for a new and more flexible transport solution.

3.3 1950-1960: Introduction of the collective taxi in the centre

The rise of a collective form of taxi occurred in central Mexico City during the early years of the 1950s. Taxi cabs began the service by picking up passengers, additional to the customer already in the cab, in the crowded streets of the centre. The collective form was successful from the beginning since its advantages of flexibility, speed and mobility allowed it to function well in areas of high traffic density and in narrow streets. The collective service occurred principally in the rush hours, par-

ticularly during the morning peak between 7 and 9.30 a.m. when it was necessary to arrive at a destination on time. Thus many vehicles were converted to collective taxis between 7 and 9, to later revert to the function of normal cabs⁴⁾. The three major characteristics of the service were: firstly, it was outside the law; secondly, the vehicles travelled fixed routes, frequently over established bus routes to alleviate the overcrowding of buses; and thirdly, they charged a flat fare of a peso irrespective of distance travelled, thus giving rise to their popular name of "peseros".

Let us look more closely at the first characteristic. The illegality of the collective taxi vehicle was due to the fact that an ordinary taxi cab cannot travel empty without its "for hire" sign displayed. How could a prospective passenger know, therefore, that the vehicle was not at that moment a taxi, but a pesero? The driver circumvented this problem by seating a helper (relation, friend, learner driver) next to him "playing" the passenger. Thus the for hire sign could be turned off and another four passengers picked up⁵⁾. There were no urban laws specifically governing peseros; in December 1951 the Taxi Legislation Laws were passed, laying down the regulations which basically rule the taxi industry today and the pesero service has remained under these laws (DDF/DGITT: 1975, 4).

During the 1950s, the collective taxi service slowly gained government recognition, though never legalization, and licences were granted to drivers allowing them to operate collective taxis during the busiest months around Christmas. From 15th December until 6th January, a "cartulina" or driving card could be bought to allow drivers of taxi cabs or private cars to pick up up to five passengers for a peso fare on fixed routes

4) FOURACRE and MAUNDER (1979, 2) mention this process at work in reserve in Istanbul: "In Istanbul, the true taxi is very often switched to a bus service in slack periods."

5) This process was described by Sr. Gonzalez, president of Route 2, interviewed 16/XII/1981. Route 2 started the service 'Zocalo to Chapultepec' in 1956; this route is still in existence.

along central streets (VERA: interviewed 15/XII/1981). In 1956, the Excelsior newspaper (12/I/1956, 6) reported that: "Owners of private cars who provided a collective taxi service during the past holiday period have sent a petition to the head of the Department of the Federal District asking the Director of Transit to allow them to 'continue their service as long as the transport problem remains unsolved'." The service provided by these cars spread illegally throughout the year, and the number of pesero routes increased. The creation in 1958 of a route from the centre south down Calzada Tlalpan (Map 2) (EXCELSIOR: 24/II/1980, 3) plus routes serving the industrial expansion in Naucalpan, Ecatepec and Tlalnepantla (Map 4) (EL COLEGIO: 1975, 9), marked the extension of the service beyond the immediate centre.

3.4 1960-1970: Extension of the service into the periphery

3.4.1 Transport characteristics in an urban periphery

It is important to define the urban periphery area especially as it is here that we will see, in the Mexico City example, the enormous recent growth of the collective taxi system. Let us look at the peripheral area: firstly, at its importance in transport demand, and secondly at the situation in Mexico City. The main task for urban transportation in the last two decades has been to move people between the core or CBD and the periphery. In the United States and Great Britain peripheral expansion is the result of suburbanization. The process of change or urban development which we term suburbanization has occurred as the businesses and higher densities of the centre spread outwards (WEHRWEIN: 1942, 217). In Mexico the process occurs as urban services are introduced into outlying settlements (FERRAS: 1977, 13). In most peripheral areas, transportation has been the primary agent for the process of peripheral consolidation,

particularly the private car. There is apparently no limit on this outward movement (DAVIS: 1965, 42) - commuting or the daily movement into the centre is a characteristic of all urban hinterlands. Transportation problems stem from the fact that suburb residents are automobile oriented and most unwilling to accommodate inflexible bus time-tables. In Mexico City as well as in other large urban areas, these residents have longer, more time-consuming and more costly journeys.

PRYOR (1971, 59) underlines the dynamism or transitional character of the outer city area - a fringe area is always moving further out - and he recognises an urban periphery by the characteristics of: "incomplete range and penetration of urban utility services, unco-ordinated zoning or planning regulations (and) areal extension beyond, although contiguous with, the political boundary of the city" (1971, 62). WHITEHAND (1967, 231) describes the similarity between diverse fringe areas - they attract large land users such as industry and low density housing, retaining their characteristics long after they cease to be at the actual fringe of the built up area. He also stresses that residents of the periphery are economically tied to the central city and that transportation between the two areas is therefore vital.

3.4.2 Transportation in Mexico City's fringe area

In much of Mexico City, the 'rural-urban fringe' is 'urbanising' rather than urbanised, and the urban facilities, including transport services, are frequently sparse. Some of the peripheral areas contiguous with Mexico City's urban area are reminiscent of the suburbs of cities in the United States and Britain, principally those to the south and west of the Federal District, but in the north and north-east, where rapid expansion has occurred, the urban fringe has spread onto the cheaper land of the State of Mexico (Map 1, A3). The municipios of Naucalpan, Ecatepec, Tlalnepantla and Chimalhuacan experienced an average 13.8% growth

rate 1960-1970 (UNIKEL: 1976, 137), and the adjacent municipio Netzahualcóyotl increased its population tenfold in the same period (FERRAS: 1977, 12). The introduction of services into these areas is frequently hampered by the presence of swampy soil (for example all the Texcoco area, built on a former lake bed) or hilly terrain (such as the volcanoes of the Chalco and Amecameca area), or is otherwise uneconomic due to low densities. Peripheral low income residential areas have spread beyond the range of paved streets, thus buses find them difficult to enter. Transport services are, however, necessary: in Netzahualcoyotl, for example, there is one private car for every 250 residents (FERRAS: 1977, 20). The horizontal growth caused by the movement of lower income residents to peripheral locations in the State of Mexico (in-migration both from the Federal District itself and from the country as a whole), and by the existence of a 1945 law prohibiting the building of more residences in the Federal District, has caused the capital to sprawl over an area larger than economic factors and mobility would dictate thus bringing enormous passenger transport difficulties.

At the end of this decade, in 1969, the first Metro line was completed, bringing mass transit to the eastern edge of the Federal District, at Zaragoza (Map 5, C2). This major transport development took the workforce from the inner fringe area (for example 330,000 people daily from just the municipio of Netzahualcoyotl: FERRAS: 1977, 22) into the centre, and the collective taxi service expanded into the outer periphery in order to act as a 'feeder' to the Metro stations.

ROSENBLOOM (1971, 9) has noted in a study of United States' jitney systems:

"It seems that when a community develops a particular transportation need, and that need is not met by traditional transit facilities, operations like the jitney spring up to meet the need. Just as importantly, it appears that there are a large number of individual private entrepreneurs willing to provide this 'unconventional' service."

These conclusions explain the situation in Mexico City's periphery. Neighbourhood groups, not able or not willing to use the scarce bus coverage, organized informal services amongst themselves; there are examples of this self-help organization in communities and squatter settlements throughout Latin America⁶⁾ and in many Third World areas. OWEN (1976, 323) has described paratransit as "a community recycling of the automobile".

During the 1960s the collective taxi lines, again as a complement to inadequate bus services, were formed outside the central city. The first was in Colonia Ruis Cortines (Route 13, Map 4) (ESCOBIDO and CASTRO: 1981, 58). The case-study line Route 9.3, travelling from Zaragoza to Netzahualcoyotl, was initiated unofficially in 1963 when there were no bus lines in this area (see Section 5.4.2). New lines on the periphery grew up spontaneously using private vehicles and therefore working illegally. The drivers operated under the system of 'amparo' or protection. An amparo is a legal document, obtained from a judge in order to protect individual cars or whole routes from the authorities of the police department for a specified period of time. The illegal cars, working under legal protection or 'pirateering' on existing routes, are known as 'tolerados' - the illegal routes are known as *rutas toleradas* - they are tolerated but not officially accepted by the government. Practically all the new lines on the periphery which were formed after 1968, link Metro stations (Map 3) with residential areas⁷⁾, providing the peripheral areas with a flexible connection between rapid mass transit and the home.

6) See PEATTIE: 1980, 1-31, for examples in Colombia; TAGES ANZEIGER: 1975, Mag. 33,7, for Peru; TURNER: 1973, for Chile.

7) 169 of the total 276 lines operating in the urban area have a Metro station as their terminal (1981).

3.5 1970-1980: Expansion of the collective taxi sector

The decade 1970-1980 saw an enormous increase in the number of collective taxis working in the urban area, especially in the number of 'tolerados'. As we have seen in Chapter One, officially recognized collective taxis increased by 69% in this decade whilst the number of tolerados working increased by 99.4% (FIGUEROA ALCOCER: 1971, 1; DEPARTAMENTO DE AUTOTRANSPORTES Y ESTACIONAMIENTO: 1980, 41). The organisations representing the collective taxi driver increased from two to 16⁸⁾. Publication of the fact that the government was going to issue official number plates to 3,000 tolerados caused an influx of new cars hoping to be registered (EXCELSIOR: 15/I/1978, 3). There was also a continued population increase in the Federal District: census figures 1971: 6.8 million; 1981: 9.4 million. Both the lack of buses and the extension of the urban area (EL COLEGIO DE MEXICO: 1975, 627-628) raised the demand for transport facilities. Conversely a greater transport network led to greater movement. Thus there was a continual rise in Metro use (1973: 1.5 million: ULLOA: 1973, 3; 1977: 2 million passengers per day: EL UNIVERSAL: 11/VI/1977, 21). As a consequence came increased collective taxi use.

In 1976, the chamber of deputies registered 33 collective taxi routes⁹⁾, numbering them from 1 to 33, and recognized 32 "Servicios Colectivos Especiales" or tolerados (GACETA OFICIAL: 18/XI/1976). According to police records, therefore, collective taxis date from this year¹⁰⁾. There were 4,000 cars operating on the 33 registered routes at this time and "for the last twenty years they had been considered temporary" (BORJA et al: 1976, 11). The official recognition of the collective taxi form was an impetus to growth and by 1981 (COVITUR: 1981, 6) the number of routes working in the urban area had extended to 100.

8) Information from a study of the EXCELSIOR newspaper 1970-1980.

9) These routes represented 26,614 drivers (DEPARTAMENTO DE AUTOTRANSPORTE Y ESTACIONAMIENTO: 1980, 15).

10) Interview with Major VERA, Police Department: 15/XII/1981.

It has to be underlined that the growth described above is predominantly illegal - we shall see in the case-study details that two of the lines studied started as tolerados and were later registered whilst the third has remained (1983) unofficial. In a study of tolerado growth (UNO MAS UNO: 1/VI/1981, 33), the spokeswoman for the Union of Collective Taxi Drivers on Tolerado Routes explained:

"In four years the number of tolerados has increased sixfold. The problem with these routes began in the early 1970s when they spread throughout the peripheral zones, principally in the rush hours. They sprang up to serve the illegal squatter settlements of these zones since there were no other transportation services."

The article concludes: "Legal or illegal, tolerated or not tolerated, they provide a necessary service and alleviate the present transport network which is officially recognised as being deficient."

The importance of the collective taxi mode, even though illegal, is the conclusion of many articles: "Recently the Police Department recommended the granting of new permits to Tolerado drivers because the service they provide is so indispensable" (UNO MAS UNO: 2/VI/1981, 25). The description of tolerado growth had been reported as early as 1972:

"Every day, travelling in the morning from south to north and in the evening from north to south, hundreds of private cars carrying out the function of peseros, transport the thousands of residents from the Colonias and villages of Ixtapalapa, Xochimilco, Tlahuac and Milpa Alta who lack other forms of communication. From Tulyhualco to Milpa Alta, the fixed route service is completely covered by private 'tolerado' cars" (EXCELSIOR: 17/XI/1972, 27) (Map 1).

The illegality of these vehicles is not only due to their lack of an official public transport number plate but also to their un-roadworthiness and fluctuating fares: "The fare between Ixtapalapa and Tulyhualco is three pesos each but passengers have

reported that there are times, when there are fewer cars, that the drivers charge whatever they want" (EXCELSIOR: 17/XI/1972, 27). The illegal purchase of permits, annual revision certificates¹¹⁾ and amparos¹²⁾ also became part of the collective taxi 'business' in this decade. Towards the end of 1980 the Police Department described this transport mode as being "immersed in complete anarchy" (EXCELSIOR: 9/X/1980, 3). We conclude that control of this rapid development is vital and look at the internal and external controls present in the next paragraphs.

3.6 External Control

Since later collective taxi growth has been characterised as illegal and anarchic, it is interesting to look at the role of the Police and Transport Departments in the service's present control and organization. The 1976 recognition of the collective taxi form put it under control of the Departamento de Autotransporte y Estacionamiento, a branch of the Police Department: permits, number plates and the registration of new routes are the concern of this office. Amparos protect the service from fines by the local police, whilst the lack of alternative public transport to deal with the great demand assures government tolerance of the collective taxi mode. Collective taxi drivers report: "The reason the police do not intervene to discontinue the service is that the authorities feel that the collective taxis, however bad that they are, are better than nothing" (EXCELSIOR: 17/XI/1972, 27).

Though better than nothing, recent growth in the collective taxi numbers has not helped efficient control, nor are the new drivers well organized. In 1978 (EXCELSIOR: 16/I/1978,

11) 1980 costs: 38,000 and 50,000 pesos.

12) By 1981 at least 25,000 people, mainly owners, had paid 5,000 to 6,000 pesos each to gain protection through an amparo (Licenciado OSEGURA; legal advisor, Departamento de Autotransportes y Estacionamientos, interviewed 27/XI/1981).

11), the president of the Coalition of Taxi Drivers reported: "The 3,005 private cars authorized to drive as 'tolerados' on 32 routes in the periphery of the city, are in their great majority total wrecks and should be substituted by models of 1965 or later." Thus many of the vehicles were over 13 years old. A study produced in the early 70s had stated: "The normal duration for efficient working of a taxi vehicle of any kind is three years in operation, after which maintenance and reparation costs rise considerably" (FIGUEROA ALCOCER: 1971, 10). Thus, the study concludes, a large majority of the vehicles working are in constant need of repairs.

The external control of the service also fails to maintain order amongst the different groups or routes. Arguments and 'pirateering' are frequent: "Yesterday saw a confrontation between 'tolerado' drivers and authorized drivers of the route from Metro Xola to Unidad Constitucionalista in Ixtapalapa. In the scuffle 7 people were injured" (EXCELSIOR: 7/II/1980, 1). The control of the service is based on the 1951 Ley del Taxista (GACETA OFICIAL: 31/XII/1951). This law was extended with the official recognition of the peseros in 1976 (GACETA OFICIAL: 15/VIII/1976): a 1981 edition of the regulations under which the service is controlled forms Appendix 5. The regulations concern the siting of the terminal or base and the route to be used, the stipulations for the vehicle, the granting of permits and the internal organization of each group (see Section 3.7).

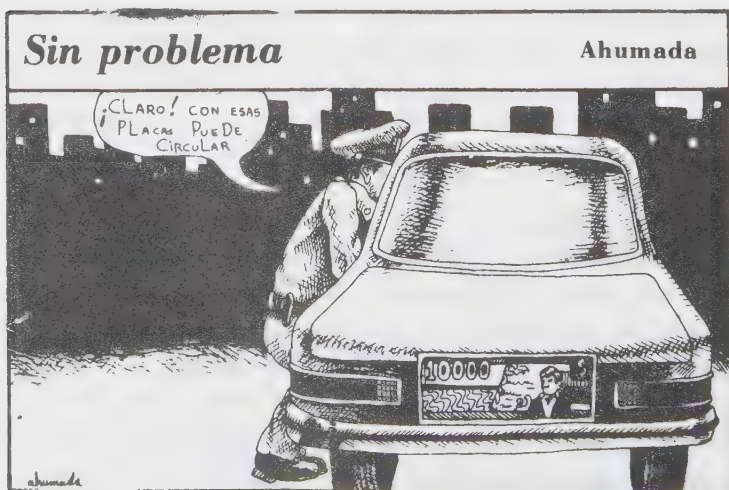
In order to ascertain the viewpoint or opinion of those controlling the collective taxi sector, interviews were carried out with members of the Police Department and of the government bureau responsible for collective transport (see Appendix 3 for the questionnaires). In May 1980 the Departamento de Autotransporte y Estacionamiento published a report entitled: "A socio-economic study with relation to the urban public passenger transportation service in taxi cabs in the Federal District"; Lic. Osegura, one of the authors of this study, was

interviewed (see footnote 12). Though his department oversees the establishment of terminals and routes, Sr. Osegura felt that government control should be stricter with the eventual phasing out of peseros in favour of buses. Because of the above-mentioned study, the City Council began a programme of awarding official number plates to 25,000 tolerados, feeling that the service provided by them was vital. The programme began with the award of 3,000 sets of plates in February 1981 (EXCELSIOR: 16/II/1981, 11), but Sr. Osegura noted that by December 1981 more than 40,000 vehicles (some in service but others just interested in obtaining plates to re-sell) were registered in his office as awaiting plates. Thus the problem of controlling the illegal vehicles has not been solved.

For the government point of view, an interview was conducted with Arquitecto Gonzales, a director in the Commission of Urban Transport (COVITUR) (17/XI/1981). Sr. Gonzales stressed the anarchic and spontaneous nature of pesero development but noted that the service works as an indicator of trouble spots - a pesero route only comes into being because a transport need is not being filled. Again the interviewee felt that public transport should be concentrated upon the buses and believed that with municipalization, and investment into the bus service, peseros would disappear by themselves. Particularly important was that public transport should be a service rather than the competitive business it is for collective taxi drivers and owners. Concluding, Arq. Gonzales described the collective taxis as "a illness and a vice".

Licenciado Vidaña, director of the government run bus service, was also interviewed (10/XII/1981). He discounted competition between buses and peseros saying that the two serve different clientele at different hours. He, too, referred to the pesero as an indicator or "thermometer" of the transport situation, and mentioned the pioneer role of this mode in opening up new transport routes. He felt too that, in time, collective taxis would become redundant. Thus the government offices involved portray an acceptance of the illegal mode as a temporary aid.

Direct external control comes from the policeman in the street: his power to stop vehicles with no official number plate and to demand a mordida: a tip or fine. This can happen daily: thus the application of a route for an amparo is really the formation of an organisation of mutual defense in dealing with the police. The corruption of the police in this matter is widely mentioned (see cartoon, below), and illegalities amongst the controllers themselves have been noted: Santibañez, a director in the Departamento de Autotransportes y Estacionamiento, is reported to have sold collective taxi permits (UNO MAS UNO: 21/IV/1981, 26), and Aguirre Salazar, late controller of the Federation of Taxidrivers' Unions, has been accused of murdering a driver (UNO MAS UNO: 2/VI/1981, 25). In conclusion, however, the police have little recourse to justice: "When police agents fine pesero drivers the latter win most battles due to the lack of legal sanctions that can be used against them" (UNO MAS UNO: 4/XII/1981, 35). Control of the driver is much more stringent within the collective taxi groups themselves. A driver benefits from the political and community representation afforded a member of each 'route' and we shall see in the following paragraphs that the 'president' of the route, along with the dispatcher and the car owner, all exert a controlling function over collective taxi drivers.



Source: UNO MAS UNO: 2/VI/1981, 35.

3.7 Internal Control

3.7.1 The route 'presidents'

Each route has a president or organizer to represent the drivers and owners of the group at union meetings and to enforce internal control. The case-study routes' presidents were interviewed (see Appendix 3 for the questionnaire) in order to understand their role in the development and organization of each group. The presidents are responsible for the continued growth of their group, and the newer lines show frequent changes of price, numbers of vehicles and routeing - the sign of an informed president. Route 1.20 for example began in 1979, covering half of its present distance, charging 15 instead of the present 25 pesos and with five to six vehicles - there are now 500 in the group. Presidents can move from a smaller tolerado line to a more important established route in the centre. Some of the routes (for example Routes 9 and 26 (see Appendix 1 for details of these routes)) began as tolerados under amparos but have since been officially recognized. The organizers interviewed underline the importance of serving public demand, encouraging drivers to establish contact with their passengers and changing routes and terminals to suit the user. Route 85, for example, extended its service by an hour in the evening after public asked for it, and Route 9 offers a door-to-door service after 11 p.m. The presidents could also quote examples of the public's support of peseros by continual use, especially in the case of tolerados where both driver and passenger are aware of, but benefit from, the illegality of the system.

Organizational problems are principally those of dealing with owners and drivers on the one hand and with the local police on the other. Unfortunately, each group acts alone, with competition rather than unity between the different collective taxi routes. The presidents' main tasks are to provide unity within the group, to look after the owners' and drivers' in-

terests and to transport the maximum number of passengers possible. Some of the collective taxi presidents (for example the late Aguirre Salazar) are very powerful politically.

3.7.2 The Dispatcher

The day-to-day organization of rotas and service control is carried out in the terminal office and by the dispatcher on the street. Table 5 shows a copy of the control card used for each vehicle. The column 'desp' is where the despachador's initials certify that the vehicle has entered the terminal and at what time. The dispatcher is responsible for the smooth running of the service - that cars leave regularly even if they are empty and that the daily rota is followed. The dispatcher is responsible for the orderliness of the terminal and he is the contact point between the organization and the public - he frequently receives the complaints from both sides. Dispatchers are commonly too young, too old or in some way not able to be drivers: the younger ones will eventually join the fleet of drivers, the older dispatchers were often drivers previously. The job carries neither social security, nor pension, includes one free day and a low wage but the drivers usually tip a dispatcher when he signs their card. Each route should therefore have at least four dispatchers - one at each terminal doing two or three daily shifts. During the period of investigation of the case-study route 9.3, however, no dispatcher appeared.

3.7.3 The Owner

The questionnaires used in the case-studies showed (see Appendix 3 and Section 5.2.2.3) that 54%, 53.1% and 30.6% of vehicles of routes 9.3, 1.20 and 85 respectively were driven by their owners. There are also drivers who own more than one vehicle - the others are rented at a daily rate. This rate varies around 400 pesos for a four door saloon and 800 pesos for a Volkswagen Combi (see Section 5.2.2.3). The amount of rent

Table 5: Control Card: Route 85

A PROP. L. M.

AGRUPACION NAL. SOR JUANA INES DE LA CRUZ

Tarjeta de Control

Fecha 16-11-81

Auto No. 73

B Debe 9 Semanas.

Operador Gabriel Dominguez

Base	HORA LLEGADA	HORA SALIDA	DESTINO	NO. DE PASAJEROS	DESP.	OBSERVACIONES
02U	12-30	12-38	MEX	4	11/12	
MEX	204	1740	CLL	4	11/12	276-21
02U	11-55	12-34	MEX	6	11/12	20-11-81
MEX	7-04	156	02	6	11/12	20/12/81
02U	425	530	MEX	3	11/12	
MEX	19	17	CLL	6	11/12	20-2-81
02U	4.15	5.30	MEX	3	11/12	21-2-81
MEX	716	850	CLL	3	11/12	2-2-81
02U	12412	1250	MEX	6	11/12	21-Feb-81
02U	5-00	5-15	MEX		11/12	
MEX	1750	1820	CLL	2	11/12	22-2-81
02U	3-15	4-10	MEX		11/12	22-Feb-81
02U	4-35	5-05	MEX	4	11/12	23-1-81
MEX	213	214	CLL	0	11/12	2-23-81
02U	4-20	9-25	MEX	3	11/12	
MEX	1140	1141	CLL	0	11/12	21-23-21
02U	1-35	3-00	MEX	5	11/12	23-Feb-81
MEX	1604	1640	CLL	6	11/12	23-2-81
02U	3-55	7-56	MEX	6	11/12	23-Feb-81
MEX	2120	2120	02U	6	11/12	23-2-81
02U	12-00	1-50	MEX	3	11/12	24-2-81
MEX	1535	1535	02U	6	11/12	24-2-81
02U	5-16	5-35	MEX	5	11/12	24/2/81
MEX	195	20	02U	5	11/12	24-2-81
02U	4-20	4-45	MEX	4	11/12	25-2-81
02U	6-50	6-51	CLL	6	11/12	25-Feb-81

is decided by the owner who also pays any major renewals apart from accident costs. The owner therefore receives a fixed sum - his 'income' does not depend on the number of passengers transported nor on the hours worked. The organizers of the route depend upon the owners for the fleet and there are frequent 'owners assemblies' to discuss extension of the route, to air complaints against drivers, to collect money for amparos and to clarify organization and discipline. It is difficult to categorize owners: one may be two housewives who have saved up for a vehicle, another may be a route president who owns 15 vehicles. It is expensive to buy a permit and number plates and as the collective taxis become more of a competitive business, so owners are more likely to be business men or politicians. The regulations do specify that no owner should have more than "two vehicles destined for the use of the public" (DEPARTAMENTO DEL DISTRITO FEDERAL: 1970, Artículo 4, num. XI).

3.7.4 The Driver

The detailed running of the service depends upon the drivers themselves. Historically, each driver was an owner or was one of a group of neighbours who had joined together to buy a vehicle (ESCOBIDO and CASTRO: 1981, 58). With increased mobility and the increasing popularity of the pesero service, investing in more than one vehicle became more common, and drivers form a separate category to owners in many cases. Subject to payment of a daily rental fee, the pesero driver is reasonably independent in terms of number of journeys made, passengers transported and hours and days worked. A quota must be paid to the group (see B in Table 5), to cover organizational costs, and the driver must pay for petrol and accident repairs. Drivers, not owners, bear the fluctuations in earnings arising day-to-day according to the weather, and week to week according to the distance from pay day. There is an attraction, however, in being virtually self employed - long hours are a means of making a profit, and many drivers take a day off "only when

the car is out for repairs". The disadvantages are that the driver receives no compensation when the car breaks down; when he takes a day off, whether it is Christmas or he is unwell, he receives no pay though the rental on the car is still due. The drivers therefore have no security of salary. Good wages are possible by operating long hours (average 72 hours per week - see Section 5.2.1) if the vehicle can be kept running.

Entrance into a group as a driver is usually through the recommendation of other drivers or by working for the group as a dispatcher or odd-job man. The graphs in Sections 5.2.1 to 5.2.3 will show us the ages, experience and working hours of the drivers in the three case-study routes. The drivers work under precarious conditions but this may be preferred to the stability, low wage and low mobility of a steady job. Drivers may earn three times as much as some passengers: a study put their earnings at an average 951 pesos per day: this has been minimised by the drivers but it is still four times the minimum wage (ISTME: 1981, 25). The structure of the sector as a whole lacks formality and general legislation, but is characterised by particularistic and flexible arrangements. Only one of the 316 drivers questioned was a woman.

Chapter Four: The Collective Taxi in Mexico City - public demand

4.1 Localising public demand with the use of questionnaires

The second hypothesis set out in Section 1, was that, as a paratransit system, the collective taxi would be able to mould itself easily to public demand. In this chapter we would like to look at the daily profile of travel in collective taxis in order to understand those facets of demand that can be measured. It is impossible to uncover true demand - demand is shaped by the transport network existent - but since the passenger can choose to use the collective taxi or not, an analysis of passenger behaviour shows us how far the collective taxi is successful in serving Mexico City's public. From the historical processes noted in Chapter Three we see that the collective taxi grew up specifically to satisfy demand: in the centre due to the extra demand of increased passenger numbers and on the periphery due to the demand for transport services where there were none. In the following paragraphs we look at the present demand for the collective taxi analysed by means of special interviews (see Chapter 1.5). We itemise origin and destination, travel motives, occupational characteristics of the passengers, modal split, travel times and fares.

Two questionnaires were written for the analysis of passenger behaviour - they are set out in Appendix 3. They both sought data on travel habits and also attempted to measure the satisfaction of the trip-maker with collective taxi solutions. The first questionnaire was a simple, general look at the origin and destination and travel motive of the passenger and asked the opinion of the line being used. This questionnaire was carried out with a sample of 7,921 passengers travelling on the 24 most heavily used lines (calculations for this sample

form Appendix 2). The questionnaire was asked by investigators at ISTME¹³⁾. The results were tabulated by the author in the ISTME office and were published in October 1981 (ISTME: 1981: Reestructuración del servicio de automoviles de alquiler en el Distrito Federal Book No. 399-69-22, Vol. 1 and 2). This groundwork survey also formed the polit-study for the second questionnaire which involved the detailed case-studies.

The second questionnaire was carried out personally. The interview technique used for all questionnaires in the study is that of direct questioning with mainly closed questions. There are two main questionnaires for the case-study work: one for the passengers, with results set out in Chapter Four, and one for the drivers, with results set out in Chapter Five. These questionnaires had to be carried out quickly and at the route terminals; we therefore decided that a closed question format was easiest. The questions were asked in Spanish, after explaining that the answers would be used for a thesis on urban transport. While the first study provided basic information, the second was a closer look at the daily transport pattern on three collective taxi lines: Route 1.20 from Toreo to Cuemanco, Route 9.3 from Zaragoza to Netzahualcóyotl and Route 85 from Candelaria to Ozumba (Map 5). We will follow the results of the questionnaires in six areas: origin and destination, travel motives, passenger occupations, transport modes used, travel times and journey costs. Lastly we look at the public satisfaction with the system.

13) ISTME: Ingenieria de Sistemas de Transporte Metropolitanos.

4.2 Results of the questionnaire analysis

4.2.1 Origin and Destination

The first questionnaire asked questions as to the districts of origin and destination, but answers were never tabulated due to their scope of information (the over 1,000 square kilometers of the Federal District) and the fact that the results had to be presented by a certain date. From the second questionnaire, however, it was easier to pinpoint the daily journeys, and the main desire lines are shown on Maps 7a, b and c. Each line marks a major origin point, converging on the collective taxi terminal and from there journeying to the varying destinations. The weight (and thus the width) of each line varies with respect to the amount of passengers using it. On Route 1.20, for example, 29% of passengers gave Naucalpan as the starting point for this journey. The Naucalpan area contains industry set up outside the Federal District due to restrictive laws during the 1960s and 1970s, as well as housing estates which have spread over the capital's boundary as the urban area expands. Two more areas in the State of Mexico were relatively important - Tlalnepantla (6%), a municipio north of Naucalpan which is receiving the industry spilling over from Naucalpan, and Satellite (7%), a de-centralised, middle-class suburb linked to the Federal District by a high-speed motorway. This satellite city was built in 1962 15 kilometers north-west of the capital and has been surrounded by the growing urban field. 13% of the respondees originated from Toreo - the route's terminal: these passengers had obviously walked to their nearest collective taxi line. Toreo is a large shopping centre occasioning shopping and work trips.

The stopping points on Route 1.20 are many, thus the destinations noted are various, with only two of them, Contreras and Tacubaya, registering over 5% of the responses (8% and 6% respectively). These two areas are principally residential and

therefore show up strongly on homeward trips. Otherwise, there were 53 different destination points mentioned in the 403 questionnaires. The majority are identified on Map 7a.

On Route 9.3, the major point of origin, with 24% the sample, is "the Centre" - the original CBD around the Zocalo. This area houses older office blocks, small workshops, specialised and department stores, government bureaux and restaurants. The only other points with a value over 5% are the La Merced market (6%) and the district of Roma (5.5%), an inner residential suburb which is probably responsible for passengers working as maids or caretakers. There are 28 other points within the Federal District registering between 1 and 4% of passengers, and these are workplaces registered as the starting point of the homeward journey.

The distance to Netzahualcōyotl is the shortest of the case-study routes and destinations were restricted to 16 points for the 300 completed answers. Most passengers live in the dormitory city of Netzahualcoyotl with 34% travelling to the terminal in Colonia Esperanza. 29% were travelling to a destination in Colonia Juarez, another district of Netzahualcoyotl. These can be seen on Map 7b.

The longest route, Route 85, has a similar origin profile (Map 7c) to Route 9.3, with workers coming in from the State of Mexico to work in the centre (20%), or to trade at the La Merced market (13%). Other points of minor importance are 4% visiting Centro Medico for work purposes or for doctors' appointments, 4% travelling to or from the state capital in Toluca and 5% visiting the district of San Juan Aragon on the capital/State of Mexico border. The large Aragon park and the nearby lower class residential area could provide the reasons for these trips - trips for recreation and family visits.

The homeward journeys registered on Route 85 are from the Federal District to destinations in the State of Mexico. The three principal destinations are the three major townships

along the route: Chalco for 9% of the passengers; Amecameca for 21%; and Ozumba, the terminal and most important destination with a value of 25%. Villages lying outside these towns are also important: Tlalmanalco for 10% of passengers, Miraflores and Tepetlixpa for 5%, San Raphael for 6.5%. There are 18 remaining points registered for about 1% each, plus 2% of passengers travelling to Popo Park for recreation reasons.

The origin and destination values noted above underline the use of the collective taxi as a 'feeder'. Passengers are brought in to the centre from low density areas, and the many destinations mentioned show the flexibility of this mode in comparison to mass transit. The descriptions of origins and destinations give a basic idea of the character of each route, but the following sections, based on travel behaviour results fill in the details of public demand.

4.2.2 The daily journey to work: travel motives

Travel motives were investigated in the first questionnaire in the form of an open question; in the second, for ease of correlation, they were grouped into 7 categories, plus "other". The open question of the ISTME questionnaire was later divided into work, study, shopping, visit and other, and the percentages of these categories can be seen in Table 6.

Map 8 shows the 9 major home-to-job routes where over 75% of journeys were made for motives of work. The lower values of work as a travel motive are found on routes such as Route 20 (Map 4), and Route 85 (Map 5) which run outside the central area. The long established routes of the centre, for example Routes 2 and 3, show the highest percentages of work-motivated trips (82 and 83% respectively).

The answers referring to travel motives for the case-study lines also showed high values for work-motivated trips. These questionnaires were principally conducted in rush hours in or-

Table 6: Travel Motives, sample of 24 collective taxi lines in Mexico City

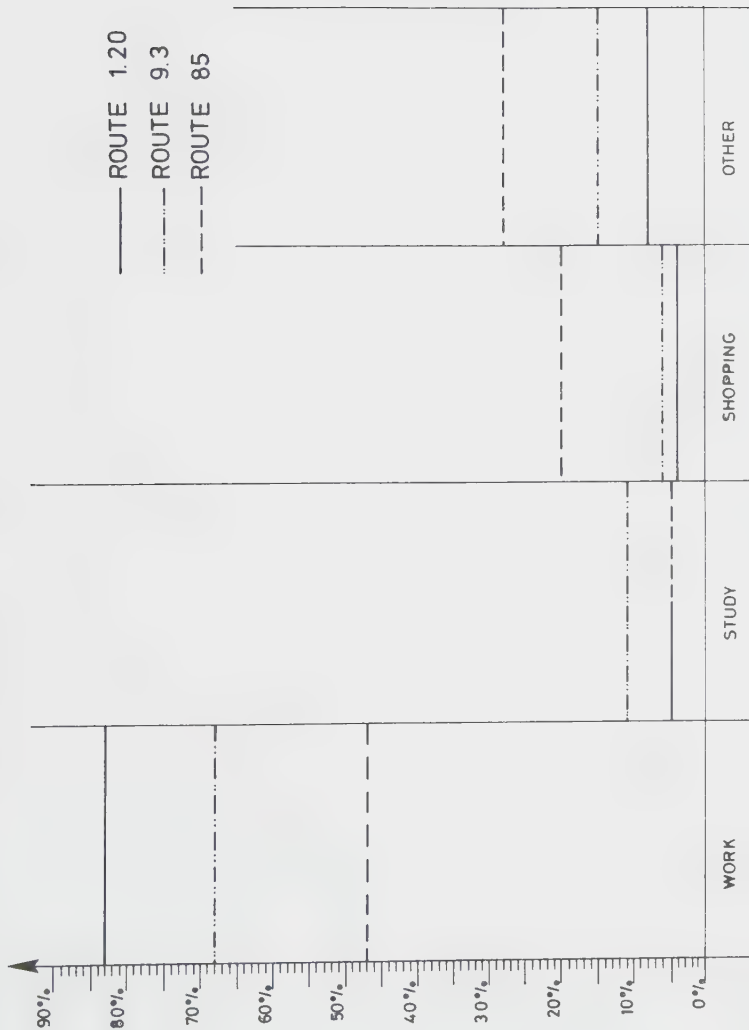
Work	70%
Study	11%
Shopping	6%
Visiting	7%
Other	6%

Source: INGENIERIA DE SISTEMAS DE TRANSPORTE METROPOLITANO: 1981, 22.

der to be able to question passengers whilst they waited for cars: naturally the majority of journeys at these times are for work purposes. This is particularly so in the case of Route 1.20 (Graph 1). Route 1.20 follows the Circuito Periférico serving industrial areas in the north (for example Naucalpan; Map 4), passing factories such as 'Baco' in Tacubaya and residential zones in Contreras and Picacho. Many passengers work in the commercial centres of Toreo and Perisur. These centres house specialised shops and do not serve daily food buying. Thus low percentages were returned for shopping-motivated trips. Though the line passes the University campus, the much lower priced bus (3, as opposed to the 20 pesos fare for the collective taxi from the terminal to the University, 1981) would be preferred. The category 'other' is higher than those of shopping and study - the majority of the passengers in the former category are journeying to medical appointments in the health centre in Cuiculco.

The profile on Line 9.3 is very similar to that of 1.20 (Graph 1). Again, work trips form the highest percentage, since the route moves passengers from a Metro terminal (Zaragoza) out to the residential area and 'dormitory suburbs' of the State of Mexico. This line is a very clear example of the collective taxi functioning as a feeder to the mass transit Metro system. As the only connection between Netzahualcóyotl and the capital

Graph 1: Travel Motives on the three case-study routes (1981)



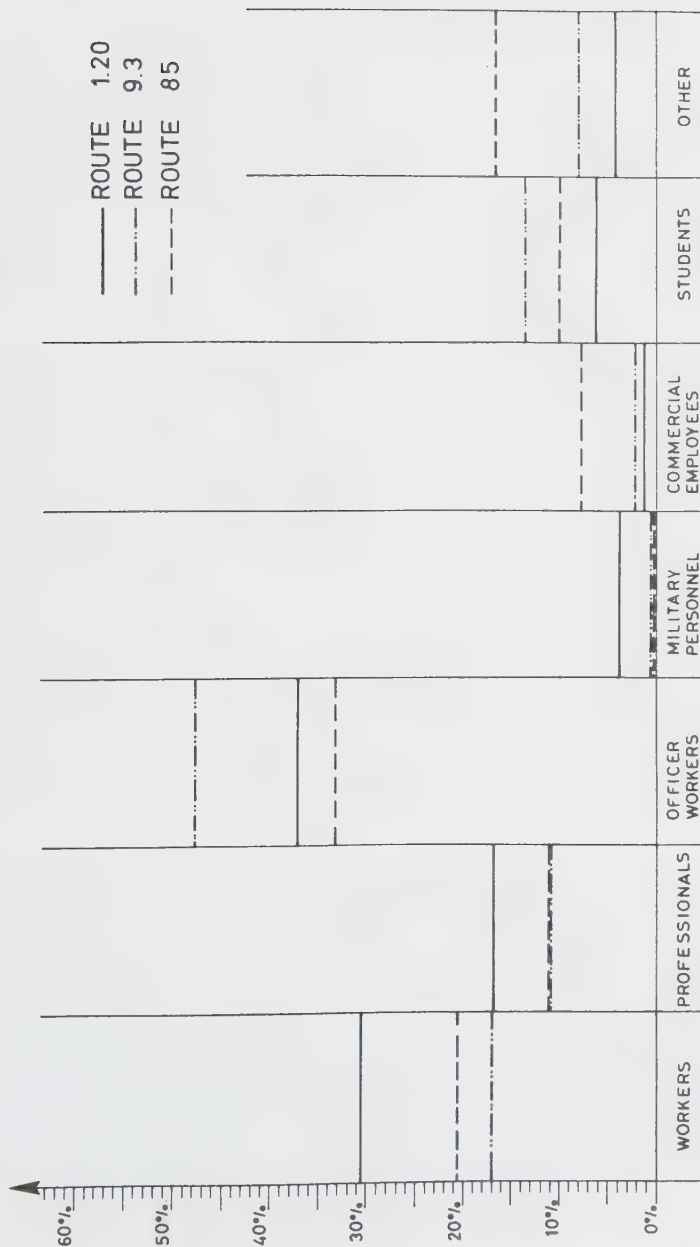
The results in this graph are based on:
Route 1.20, 416 questionnaires, 5% of all passengers; Route 9.3, 300 questionnaires, 10% of all passengers;
Route 85, 400 questionnaires, 10% of all passengers.

apart from overcrowded buses, this line therefore has more importance for the categories of 'shopping' and 'study' than seen for Route 1.20. The residents of Netzahualcōyotl do not have access to high schools and department stores without journeying to the Federal District. The 15% of interviewees who fall into the category 'other' are travelling predominantly to visit families or to recreation spots such as cinemas, theatres and parks of which there are few in Netzahualcōyotl.

Case-study Route 85 presents a different image to the two other routes, a phenomenon which we shall see repeated in the case of many of the questionnaire variables. Of the 416 passengers questioned on this route, less than half (47%) gave work as their trip motive whilst 20% were in the category 'shopping'. Route 85 crosses rural land and 3% of those questioned were farmers. Therefore, even more than with Route 9.3, Route 85 represents a journey into the city, with only 35% of the interviewees using the line daily. On Routes 1.20 and 9.3, 77% and 67%, respectively, of passengers questioned use the line daily. Route 85 is used for the journey to work but weekly - many of its passengers travel the 67 kilometers of the line into the city on Sunday evening or Monday morning, returning Friday or Saturday. For the same reason that use of the line represents a journey into the city, the category of 'shopping' is important: housewives (11% of Route 85's passengers) use the line once a week to visit the markets of the Federal District. The position of the 'in-town' terminal at Candelaria, walking distance from the major La Merced market, boosts this category. This market is in fact the reason for the terminal's location¹⁴⁾. We will see in the analysis of passenger occupations (Graph 2), that commerce is important to the route; the 'shopping' category also includes selling agricultural produce in the market. The high percentage of shoppers also shows a preference for the collective taxi over the Metro or bus since these passengers need

14) Margarito Torres, president of Route 85, interviewed 6/XI/1981.

Graph 2: Passenger Employment on the three case-study routes (1981)



The results in this graph are based on:

Route 1.20, 416 questionnaires, 5% of all passengers; 10% of all passengers;
 Route 9.3, 300 questionnaires, 10% of all passengers;
 Route 85, 400 questionnaires, 10% of all passengers.

space to transport their purchases. We will see that the large number of Combi vans on this line (Section 5.2.2) aids those passengers travelling with bulky commodities.

The 28% of passengers registered in the category 'other' on this line represents family visits and, for example, journeys to a doctor, a lawyer or trade union centre. Almost 5% of the journeys on this line have, as their final destination, the State capital of Toluca. For legal business or questions of salary for example, residents in Ozumba have a 5-hour journey, across the Federal District into the eastern State of Mexico (Map 1) to the state offices.

To conclude we can make reference to ROSENBLOOM's (1971, 9) statement that: "The common denominators of all these jitney systems is that most riders are either downtown business men, shoppers, tourists, or ghetto residents." Further to this, the lines in central Mexico City show a preponderance of work-motivated trips, whilst the longer routes, newer, often tolerados and operating beyond the capital, are used rather as a connection to the attractions of the capital city. The trip motivation graphs did not give us an idea, however, of the occupation or social class of the public which uses the collective taxi. A question on this was therefore included into the case-study questionnaire and is analysed in the next section.

4.2.3 The daily journey to work: passenger characteristics

Since the collective taxis are not the only mode of transport in the city, we wanted to analyse the social background of the public which uses them, thus also proving or disproving the hypothesis that the collective taxi's public is principally lower class¹⁵⁾. In fact, contrary to this opinion, we see in Graph 2, that in all three of the case-study lines, the cate-

15) ALTSHULER: 1976, 93; RIMMER, DRAKAKIS-SMITH and MCGEE: 1978, 190.

gory 'employee' or office-worker is the most important: 48%, 37% and 33% of passengers on Routes 9.3, 1.20 and 85 respectively. This is due in Mexico to the higher fares of this mode compared to the bus. Interestingly, this is followed by the category 'worker', for example: labourers, cleaning personnel and factory workers. This category is as high as 30% for Route 1.20. As mentioned above, this route is principally used for journeys to work, to industries in Naucalpan and to the factories of Azcapotzalco and Tacubaya. The third category, that of the professional classes, for example: teachers, engineers, accountants, is also highest for Route 1.20 (17%), due to the presence, in the south-west of the Federal District, of upper class residential districts (San Angel and Tecamachaco, see Map 4). These are close to the 1.20 route. It must be remembered that the majority of potential passengers in the professional class own their own cars - thus collective taxi passengers will be principally lower down on the traditional economic or social scale.

The category 'commercial worker' is only relevant to Route 85, covering passengers who buy up commercial products in the Federal District to sell in the State of Mexico. Of remaining categories, those of 'student' and 'other' are important. The former is highest on Route 9.3, registering the lack of higher education facilities in Netzahualcóyotl; the latter is highest - a relatively high 17% - for Route 85. The category 'other' on this route represents principally agricultural workers and housewives - both of which are important: the number of housewives using the case-study routes is 11% on Route 85 compared to 4% and 8% on Routes 1.20 and 9.3 respectively.

To conclude, although the category of employee or office worker is undoubtedly the most representative of collective taxi passengers, the overall profile of passengers' occupational characteristics varies dependent upon the area through which the route travels. It is true that employees use the collec-

tive taxis more frequently but the public demand for the service is by no means limited to this category.

4.2.4 Modal Split: the use of the collective taxi with other transport modes

As examined in Chapter Three, the role of the collective taxi is often that of a 'feeder' to mass transit, thus the majority (73%) of those questioned for the ISTME questionnaire used another transport mode as well as the collective taxi. Table 7 sets out the results in the form of the daily modal split for collective taxi passengers. The question was used on the 24 most heavily travelled lines, June to August 1981.

Table 7: Modal Split: 24 most heavily travelled lines

		No. asked	%
P		1,743	22
P A		2,218	28
P M		2,139	27
P A M		1,267	16
P Other		554	7
		7'921	
P:	pesero (collective taxi)		
A:	autobus		
M:	metro		
Other:	railway, private car, trolleybus, taxi, cycle		

Source: ISTME: 1981, 22.

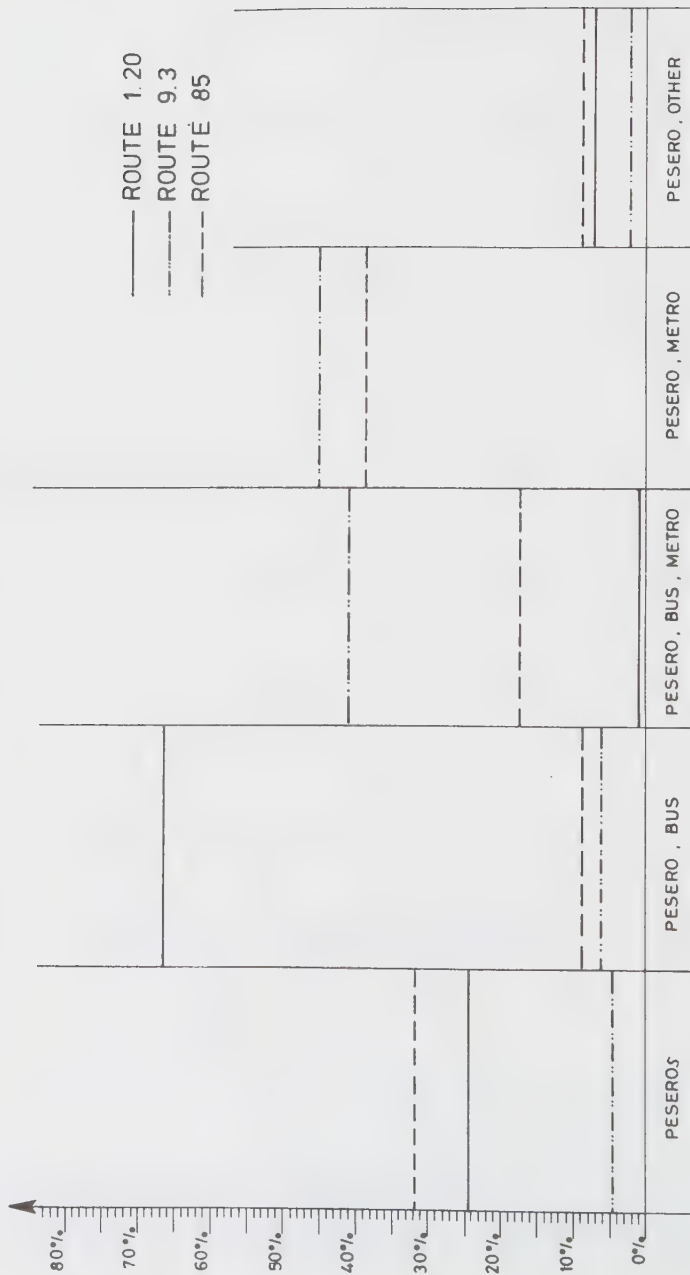
Since the questionnaire was carried out at collective taxi terminals, the percentages given are based on this mode - the passengers who travelled, on the day of the survey, by bus and Metro alone fall outside the range of the study. The categories

given cover the daily journey, thus 79% of those questioned use more than two different transport modes daily. The mode of transport used with the collective taxi depends upon what is available in the area. Since 59% of the collective taxi lines have one of their terminals at a Metro station, this mode is important; not all passengers using the collective taxi transfer to the Metro, but 43% are registered as using the Metro with the taxi lines. 16% of these passengers use all three major public transport modes, and the importance of the buses to the Mexico City transport system is seen in the 44% of questionees using this mode with the collective taxi.

The differing uses of the three major systems is repeated in Graph 3 which examines basic modal split for the three case-study lines. The modes used vary with the transport network around the terminal. Let us look firstly at Route 1.20. Here, the majority (67%) travel by collective taxi and bus - if travellers wish to use the Metro system they would go to the nearby Tacuba station (Map 3). 29% of the journeys are made by bus and taxi representing passengers journeying from Naucalpan to the Toreo terminal (Map 7a). Also passengers may use the bus after the collective taxi to journey from the route to their final destination. When buses are scarce, passengers, particularly in the employee category, may take two collective taxis instead of the taxi and bus. Thus the value of the only pesero category is second in importance on this line, with 25%. This category covers those passengers who may use 1,2 or more different collective taxi routes. The remaining category is that of the collective taxi with 'other': this would refer here to a combination with either the private car when a colleague has provided a lift, or with the trolley or light railway in the south of the Federal District for the 8% of passengers whose destinations are in Xochimilco and Tlalpan.

The passengers of Route 9.3 which has its terminal outside the Metro station Zaragoza, and of Route 85 with its terminal at Candelaria Metro station travel principally by collective taxi

Graph 3: Daily Modal split on the three case-study routes (1981)



The results in this graph are based on:
 Route 1.20, 320 questionnaires; the 77% of those questioned who use the route daily;
 Route 9.3, 201 questionnaires; the 67% of those questioned who use the route daily;
 Route 85, 140 questionnaires; the 35% of those questioned who use the route daily.

combined with the Metro (45% and 39% respectively). A further 41% of Route 9.3 passengers use all three of the major public transport modes for the journey to work. This latter percentage has two causes: firstly, it may be necessary to take a local bus from the point of origin in the city to the nearest Metro station; and secondly Route 9.3, because it enters the State of Mexico, is not permitted to pick up passengers on its return journey from Netzahualcóyotl to the Federal District - this would be taking trade from the taxis and collective taxis of the State. Thus many travellers take the bus to Zaragoza in the morning and use the 9.3 route only for the homeward journey. For this line, and for Route 85, the use of the collective taxi with a bus only is rare (6% and 9% respectively) due to the proximity of the underground network which is cheaper and (usually) faster than the buses. Even lower in value on these two lines is the category of the collective taxi with an 'other' form of transport (2% and 3%). Few residents of the eastern half of Mexico City own cars, and there are no trolley or light railway lines. There are cases of respondees taking a normal taxi because of unusual hurry or of passengers completing their journey with a bicycle, but these are exceptions. Also of note in Graph 3 is the 32% of Route 85 passengers who use the collective taxi alone - this is because they can walk from the terminal to the central city, particularly to the La Merced market which is the final destination of 33% of the passengers.

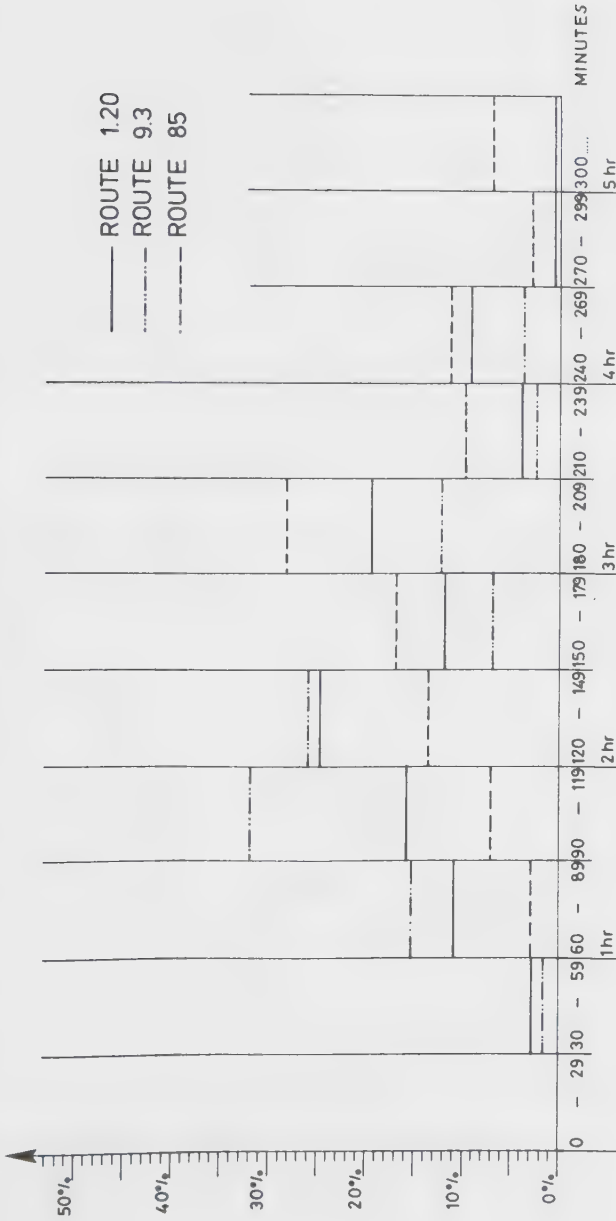
It is important to note that these profiles of daily modal split apply only to the day on which the passenger answered. As we have seen in Section 3.7.4, using a particular transport mode can depend on the weather, the number of days until pay day and also on the transport mode which is available first.

4.2.5 Time spent on daily travel

We felt that the time and money spent on a trip daily was also relevant to the analysis of collective taxi travel in Mexico City. These factors were not part of the ISTME questionnaire, but the following two sections look at travel time and fare outlay for the passengers of the three case-study routes. We found it surprising the amount of time that passengers of collective taxis spent travelling daily, especially when this mode is arguably the fastest above-ground transport. The results of the daily travel times question are set out in Graph 4. Time use values for Route 1.20 are the most variable, ranging from 3% using under an hour a day to 1% using over 5 hours. This is because the passengers on this route are distributed between more than 50 stops and travel times registered are diverse. The majority (56%) fall into the 2 to 3 1/2 hour range, and the average time spent travelling daily is 2 hours 25 minutes.

The passengers of Route 9.3 spent the least time travelling of the case-study routes: this route is also the shortest. The average commuting time for this case-study is 1 hour 55 minutes, even though 4% of those questioned were travelling 4 1/2 hours daily. For the longest route, the 85, with an average trip taking 2 hours 50 minutes, the majority (60%) needs more than three hours for their round trip. The journey to Amecameca (Map 7) is approximately an hour, that to Ozumba (Map 7) an hour and a quarter. It is understandable that 21% of the passengers are travelling over 4 hours per day. We can see from these times why such importance is given to the speed of the collective taxi in comparison to the local bus (see Section 5.3).

Graph 4: Daily Travel times (round trip) on the three case-study routes (1981)



The results in this graph are based on:
 Route 1.20, 320 questionnaires, the 77% of those questioned who use the route daily;
 Route 9.3, 201 questionnaires, the 67% of those questioned who use the route daily;
 Route 85, 140 questionnaires, the 35% of those questioned who use the route daily.

4.2.6 The daily cost of travel

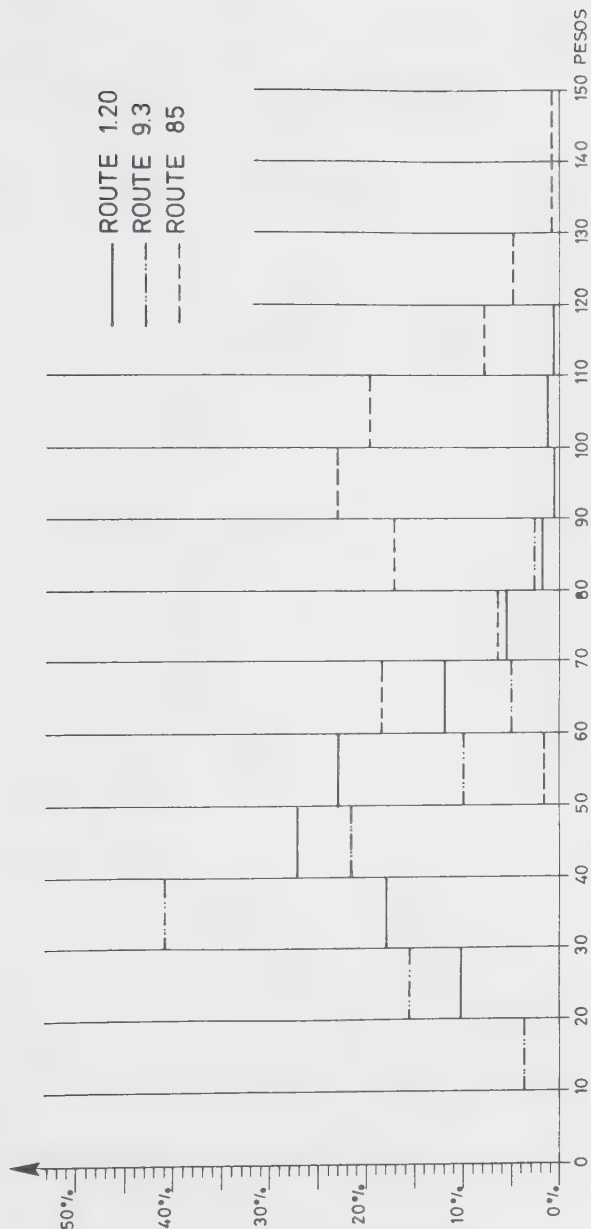
Though the bus and Metro systems of Mexico City are subsidised, making them amongst the cheapest in the world, the collective taxi fares are high. The average fare per kilometer is 1.24 pesos (see Appendix 1) for the 2,620 kilometers of the network. This is to be compared with the flat fare of 1 peso for the Metro and an average .30 peso for the buses. Naturally the longest lines (Table 8) are the most economic. These are principally tolerado routes with one in-town terminal at a Metro station and a route which travels out to the periphery or to the State of Mexico (Map 9). For the case-study questionnaires, the detailed daily fare outlay was noted from each passenger questioned. The results are set out in Graph 5.

Table 8: The longest collective taxi lines: Mexico City 1981

kms	Total Fare	Fare per km
1. 67 Candelaria - Ozumba* (SM) Tolerado	50	0.75
2. 37.5 Pino Suarez * - Milpa Alta Route 21	25	0.67
3. 37 Aeroperto * - Chapingo (SM) Tolerado	30	0.81
4. 36 Jamaica - Milpa Alta Route 21	25	0.69
5. 33 Toreo - Cuernavaca Route 1	25	0.75
6. 31.1 Gomez Farias * - Chalco (SM) Tolerado	30**	0.97
7. 30.3 Taxqueña * - Milpa Alta Tolerado	20	0.66
8. 30.3 Taxqueña * - Milpa Alta Tolerado	20	0.66
9. 29 Pino Suarez * - Tulyehualco Tolerado	23	0.79
10. 28.8 Merced - Tulyehualco Tolerado	23	0.80
* Metro station.		
** By the motorway route the fare is 35 pesos or 1.1 pesos per km.		
(SM) State of Mexico.		

The curve for Route 1.20 is again the widest ranging from 10% spending 20 pesos daily to 2% spending 100 to 120 pesos. The average daily fare for the passengers of this route is 48 pe-

Graph 5: Daily Costs (round trip) on the three case-study routes (1981)



The results in this graph are based on:
 Route 1.20, 320 questionnaires, the 77% of those questioned who use the route daily;
 Route 9.3, 201 questionnaires, the 67% of those questioned who use the route daily;
 Route 85, 140 questionnaires, the 35% of those questioned who use the route daily.

sos. The passengers paying close to 120 pesos per day are traveling from the east of the city, for example from the residential area of Meyehualco or Tulyehualco, to work in the industries of Naucalpan or Tacubaya (Map 4). Almost half (45%) of the passengers on this route pay over 25 pesos each way. It must be born in mind that the minimum wage at the time of questioning was 208 pesos per day.

Fares paid on Route 9.3 are generally lower, with the average being 36 pesos daily, and with only 18% paying over 25 pesos each way. This route travels through a poorer area: the passengers would only pay the 15 pesos that it costs to travel from the in-town terminal into the district of Netzahualcóyotl.

The most expensive line is naturally the longest: the 67 kilometers of Route 85, or a fare of 50 pesos. Those who make this journey daily rarely take the 2 to 3 hour bus journey, thus the use of this line represents, for the 25% of the passengers who travel from terminal to terminal, a fare of 100 pesos per day not counting travel within the Federal District itself. An extreme case was the passengers (1.5% of the total) who travelled from Desierto de los Leones on the western Federal District/State of Mexico border to Ozumba, paying between 130 and 150 pesos daily.

We have included time spent and fare outlay within this chapter on demand in order to describe the journeys that the collective taxi is serving. Many journeys in Mexico City are long in time spent travelling - 11% of the questionees travelled 2 hours or more one way, using the collective taxi mode for at least one part of the trip. We feel therefore that there is a demand for the speed and flexibility provided by the collective taxi. With journey times and distances increasing there is a continued demand for the collective taxi in conjunction with mass transit.

4.3 Public demand from the Collective taxi: conclusions

In a general study of public opinion (ISTME: 1981b, 18), the ISTME office carried out a sample survey of 4,000 passengers, inviting suggestions for improvement in the public transport systems. Of this sample, 405 individuals referred directly to suggestions for the collective taxi service. These replies are set out in Table 9.

Table 9: Public Suggestions for collective taxi improvement (1981)

More vehicles	40%	160
No changing of collective taxi fares	21%	87
New routes	12%	50
Transporting only 5* passengers	10%	40
More courtesy of drivers	8%	32
Vehicles in better repair	5%	19
Better organization of routes	2%	10
Longer hours of availability	2%	7
	<u>100%</u>	<u>405</u>
* 5 for the saloon car.		

Source: ISTME: 1981, 29.

From this survey we can see that the relatively high price of the collective taxi service is of little importance whilst the major complaint is lack of vehicles. According to passengers, the main problem with collective taxis in Mexico City is that there should be more of them. The importance of more vehicles comes from the fact that the public does not like to wait: waiting time has been valued at 2 1/2 times more costly than the in-vehicle time (US DEPARTMENT OF TRANSPORT: 1973, S-6). Also the appearance of frequency is more important to commuters

than merely higher speeds. In a similar investigation in Kuala Lumpur (EASTMAN and PICKERING: 1981, 8), 90% of passengers mentioned that vehicles were too full and relatively few travelers considered the level of fares as a major cause for concern.

The above sections have shown the demands made on the collective taxi sector. The vehicles are used principally for the journey to work and mainly by shop or office employees. This mode of transport is used in conjunction with other public vehicles, dependent upon what is available at that moment and in that area. Travel costs are high but the passengers consider it worth paying for the speeds that the collective taxi offers since the amount of time spent travelling is great. Lack of vehicles is in fact more important than the fares charged: in conclusion, the public would like more collective taxis to be available.

Chapter Five: Supply in the Collective Taxi Sector

5.1 Introduction: Examination of the hypotheses through an analysis of supply

In this chapter we will be able to look into the hypothesis that the collective taxi sector fulfills a specialized service adapting itself to demand, and at the theory that new lines are more attractive than old ones. We can do this by now looking at the supply side of the service - firstly its availability, secondly the vehicles and lastly the drivers themselves - with information gathered through a drivers' questionnaire. As a conclusion we look at passenger satisfaction with the service; this indicates the level of success achieved in supplying public needs.

Again a general ISTME questionnaire was used as a test run for the case-study work. For this questionnaire, drivers, a total of 800 from 19 routes with the highest number of vehicles, were interviewed - calculations for this sample are in Appendix 2. In the sections 5.2.1 to 5.2.3, where appropriate, we look at the ISTME questionnaire results before concentrating on the detailed case-studies. These sections cover the two main facets of transport provision: that the vehicle is available when needed and that the passenger can travel quickly, comfortably and safely. We have noted in Chapter Four that fare charges are relatively unimportant; in the following paragraphs we shall see that the service offered by the collective taxi, adapted finely to public demand, even allows it to charge fares much higher than the bus system.

Further to this we shall look at the collective taxi supply in comparison with other transport modes. With an analysis of the particular characteristics of the collective taxi service and its ability to complement the present network, we can verify whether this mode is offering something that no other trans-

port form does. We shall look at the relative advantages and disadvantages of other transport modes, principally on the three case-study routes.

5.2 The characteristics of supply

5.2.1 The collective taxi time-table

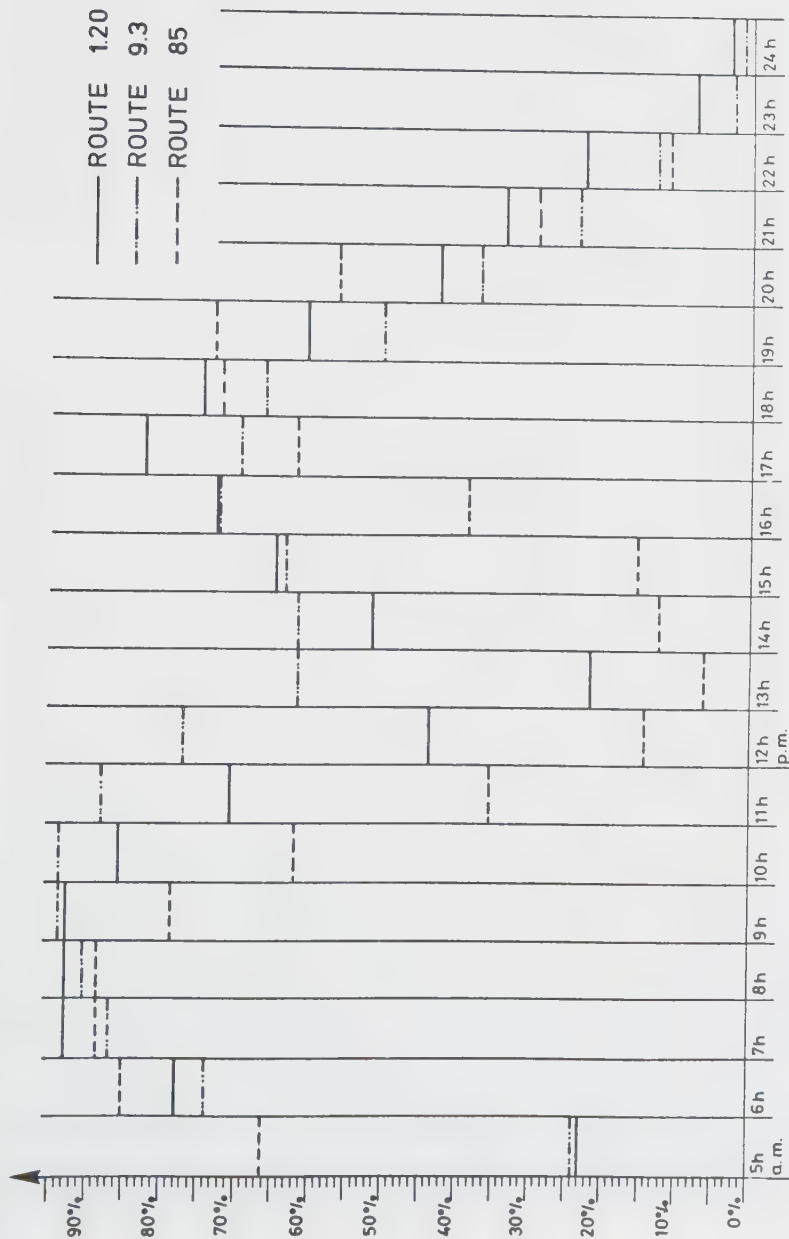
5.2.1.1 The working day

The majority (83%) of the 276 collective routes are officially in service 18 or more hours a day, with 43 of these groups working the 24 hours. This does not guarantee the availability of a collective taxi after 10 pm. As we have seen in Table 9, longer working hours are desired. The ISTME sample of 19 routes covered interviews with 800 drivers, 59% of whom work 10 or more hours a day.

Vehicle working hours are distributed throughout the day in order to move the maximum number of passengers. We can look at this distribution in detail for the three case-studies in Graph 6. As is to be expected for a transport service which is primarily used for the journey to work, the graph shows two peaks for each route corresponding to the morning and evening rush hours. The morning rush hour has a higher peak in all three cases - 21%, 10% and 5% higher respectively for the lines 1.20, 9.3 and 85. This is due to the fact that arriving late at work can mean loss of job or at least forfeiting a day's pay, thus it is important enough to validate paying the higher collective taxi fare.

Let us look at the distribution of availability for each case-study route in turn. 94%, namely 752 of Route 1.20 drivers, are working between 9 and 11 in the morning, covering the morning peak, with 91% available earlier - from 8 to 9 am - and slightly

Graph 6: The Working Day on the three case-study routes (1981)



Results on this and the following graphs in Chapter Five are based on:
 Route 1.20, 125 questionnaires, 25% of all drivers; Route 9.3, 100 questionnaires, 50% of all drivers;
 Route 85, 91 questionnaires, 50% of all drivers.

less - 88% - working from 11 to noon. The time difference between the two peaks is 6 hours, with the afternoon rush hour demand noticeable by 73% of drivers working from 4 to 5 pm. 70% are still working from 5 to 6 pm, but by 7 at night this figure has sunk to 50%. The supply of the service on Route 1.20 is concentrated during the day: in the 12 hours from 6 am to 6 pm at least 58% of drivers are working, with even 62% available during the off-peak period of 1 to 3 pm. The drivers would probably work longer hours if the demand was there; on Route 1.20, however, passengers travel principally for office hours (37% are employees, 17% professional; see Section 4.2.3).

For the drivers of Route 9.3 the working day is longer. The morning peak begins at 7 am, with 93% of the 250 drivers working from 7 to 10 am. The afternoon peak is later than that of Route 1.20, with 83% of drivers available at 5 pm. There is also a long off-peak period: between 12 and 1 pm and 1 to 2 pm only 44% and 22% respectively of the cars are available. The route works later too: at 10 pm 23% of the personnel are still working. The division of the day into two more separated definite peaks stresses the working nature of the passengers, with 48% registered as office workers.

Route 85 shows the most extreme differences, between, for example, 88% of drivers available from 7 to 9 am and the 15% or less working from 12 until 4 pm: at 1 pm only 6% of cars are in service - compared to 62% of Route 1.20. The service begins much earlier: 66% of the cars are available at 5 am in comparison with 24% and 23% for Routes 1.20 and 9.3 respectively. The afternoon peak is later, with 74% of drivers working at 7 pm, thus the drivers' day is longer with a longer middle rest period. On this route there are 10 hours difference between the two peaks as opposed to 6 and 7 hours for Routes 1.20 and 9.3. The length of service hours on Route 85 is due, to a great extent, to the length of the route. Since the journeys made on this route are long (see Section 4.2.5), for passengers to reach workplaces in Federal District they must start out early.

The average journey length on Route 85 is 40 minutes more (185 as opposed to 145 minutes) than on Route 1.20, and the morning peak occurs two hours earlier on Route 85. However, the social class of the average passenger also affects the working day (see Section 4.2.2). On Route 9.3, the morning peak also begins at 7 am: the passengers on this and the 85 route begin work earlier than those on Route 1.20. The adjusting of time-tables and the availability of vehicles in response to public demand has been seen in the extension of Route 85 until 10.30 pm. This flexibility which allows easy changes or extensions to the time-table is a further facet of public satisfaction, to be discussed in a larger context in Section 5.4.

5.2.1.2 The working week

The ISTME questionnaire reported a majority of drivers working a six-day week, Monday to Saturday (ISTME: 1981, 24). The availability of collective taxis often differs however from one day to the next: we have already seen in Section 4.2.2, on Route 85, that some workers use the line only on Mondays and Fridays. In Graph 7 we see the weekly variations in the three case-study services. Routes 1.20 and 9.3, catering for passengers that travel on the route daily, are very similar: hardly any variation throughout the working week and a dropping off sharply to 49% and 46% respectively of the service on Sundays. The high (88% and 85% respectively) percentages registered for Saturday suggest that many employees work a six-day week. Route 85, however is completely different. 34% of drivers take their day off on Wednesday or Thursday rather than Saturday or Sunday in order to cope with the demand from passengers travelling weekly into the Federal District and from visitors journeying to the volcano area around Amecameca at the weekend. 95%, 190 drivers, work on Saturday, and the same number work on Monday, Tuesday and Friday. Again the length of the route - causing its users to commute only weekly - has influenced the graph profile. The unusualness of Route 85 drivers' time-tables suggests that they have been adjusted to serve a particular demand.

Graph 7: The Working Week on the three case-study routes (1981)



See Graph 6 for questionnaire totals.

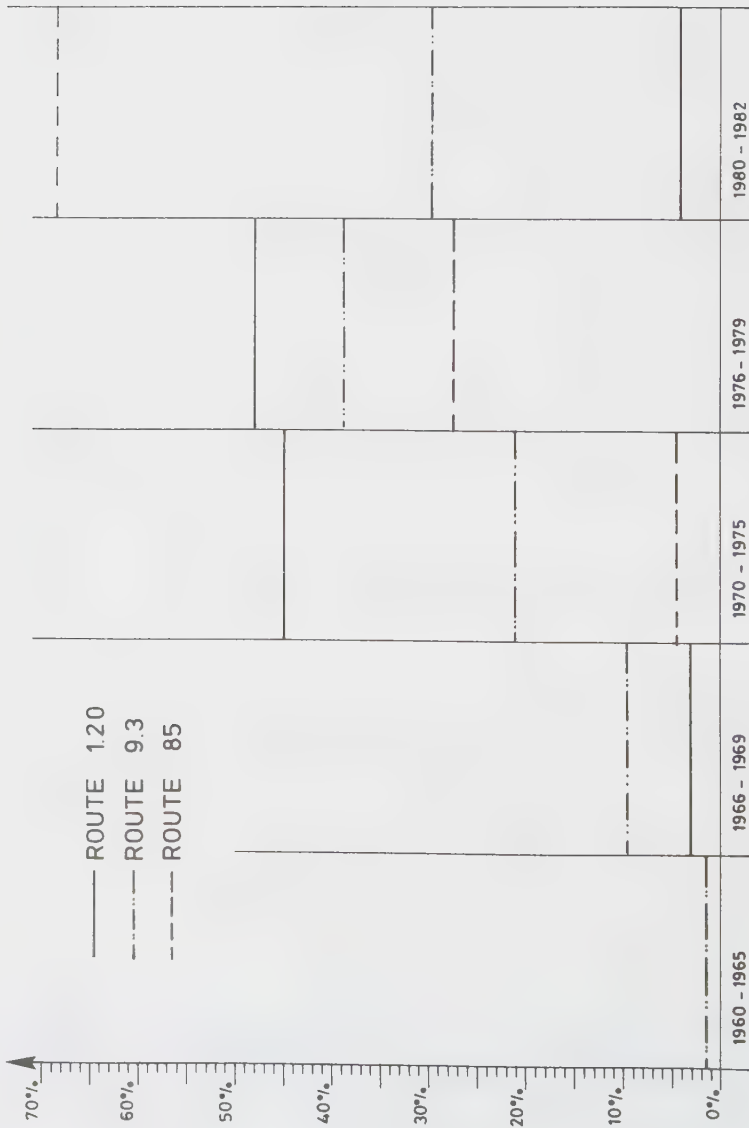
The availability of a vehicle when the passenger needs it is very important to the service. The collective taxi network in the Federal District uses the same routes as the bus system for 80% of its length (ISTME: 1981, 38), thus the passenger will frequently take the first mode available. An average 22% of interviewees on each case-study route responded to the question: 'why are you using the collective taxi?' as 'the bus (or Metro) is full'. 'Full' can mean not that the other modes are just uncomfortable, but that the buses are not stopping and that there is a queue into the Metro station. The use of collective taxi suggests therefore that other modes are not available. The taking of different modes of transport in the morning to at night, or at different stages of the month, is common. Answers registered for collective taxi use have been: 'sometimes'; 'depending on the traffic'; and 'if I've been plaid' - this fluid situation causes collective taxi drivers to adapt their timetables to the demand in order to earn a fare from as many passengers as possible.

5.2.2 An examination of the vehicle used

5.2.2.1 Vehicle age

In the ISTME study, the interviewer had to judge whether each vehicle was in a good, regular or bad state of repair. The results were unsatisfactory due to their personalised nature and were replaced in the case-study questionnaire with just the vehicle age. These results are set out in Graph 8. The age, that is the number of years since the vehicle left the factory, corresponds to the age of the route. On Route 9.3, set up in 1963, 48% of vehicles were over five years of age in 1981. However, 1.20 had 30% of its vehicles of the 1975 or earlier model and Route 85 had only 4%. Correspondingly, the newest route had the greatest number of new vehicles: 69.5% of the cars working on Route 85 were the previous year's model at the time of questioning. The age of the vehicle is particularly impor-

Graph 8: Vehicle Age on the three case-study routes (1981)



See Graph 6 for questionnaire totals.

tant when one considers that a public service vehicle, used an average 10 hours a day, can only have a useful life of five years continual service (FIGUEROA ALCOCER: 1971, 10). After five years of continual use, vehicles are dangerous, slower, less comfortable and in fact less economic for driver and owner. The age of vehicles on Route 9.3 is assuredly a reason for the negative public reaction to the line - we shall discuss this in Section 5.4

5.2.2.2 Vehicle type

The type of car used was included in the ISTME questionnaire (Table 10) but the only significant factor is the presence of the VW Combi:

Table 10: Vehicle make on 19 routes (1981)

Dodge	26.8%
Chevrolet	24.6%
VW Combi	22.7%
Ford	15.7%
Datsun	1.6%
Other	8.6%

Source: ISTME: 1981, 38.

The Combi, seating eight to twelve passengers as opposed to the five to six of saloon cars, represents a movement away from the more individual transport of the traditional collective taxi. It provides obvious advantages for both passenger and driver. For the passenger these are: easier entry into the vehicle, room in the car and the boot for luggage and the availability of more seats. The driver profits directly from carrying more passengers and the higher driving position gives a better overview of the road. Several drivers did, however,

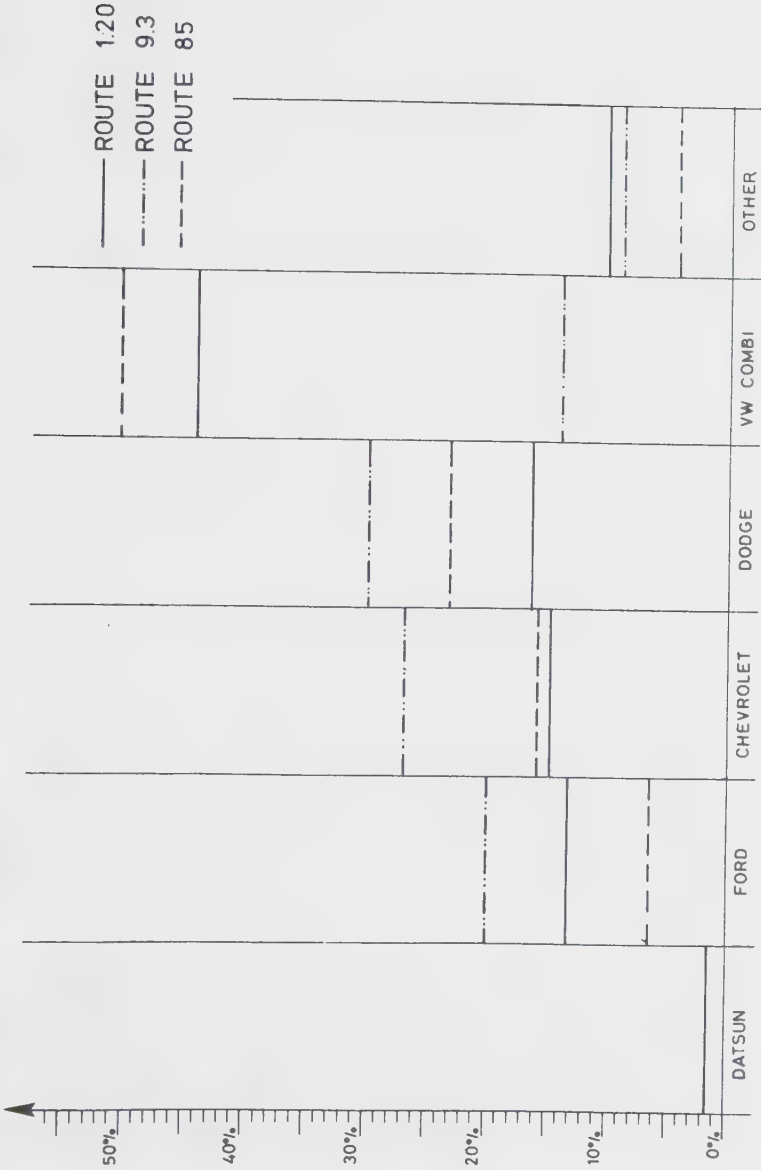
comment on the greater breakdown of the Combi engine. The Combi has been in use in the Federal District since 1976¹⁶⁾. The innovation of using it is mainly seen, on the newer lines - as we see in case-study details in Graph 9. The most important factor is the majority of Combis on Route 85 (50.5%), as opposed to 44% on the new line 1.20 and only 14% on Route 9.3. Combis are particularly useful on Route 85 since shopping, the bulk buying at the La Merced market, accounts for 11% of all trips and the Combi provides the extra space needed for transporting merchandise. The roads outside the Federal District are less frequently paved: we question if the Combi is suited. It is difficult to compare the speeds of Combis and saloons: perhaps the latter are easier to manoeuvre, but for the extra space and more seats available the use of Combis makes the newer routes more attractive.

5.2.2.3 Ownership, renting and registration

We have seen in Chapter Three that the collective taxi is driven by both owners and renters. It was felt that this could also play a role in the adaptability and attractiveness of a particular route. For the ISTME survey, the results were not significant, being 51% rented vehicles and 49% owner-driven. The question was left in, however, for the case-studies, and the owner to driver ratio was similar to that of the ISTME study for Routes 1.20 and 9.3: 54% to 46% owners to drivers for both lines. Route 85, however, again presents a different profile: 70% of the vehicles are rented. With reference to Graphs 13 and 14, we shall see that the drivers on the latter route are young - 72% less than 31 years old - and few of them (6%) have experience in the collective taxi sector; thus it is easier to understand that these drivers have little opportunity to buy their own vehicle.

16) BARRERA, General Secretary of Route 1.20, interviewed 15/XII/1981.

Graph 9: Vehicle Type on the three case-study routes (1981)



See Graph 6 for questionnaire totals.

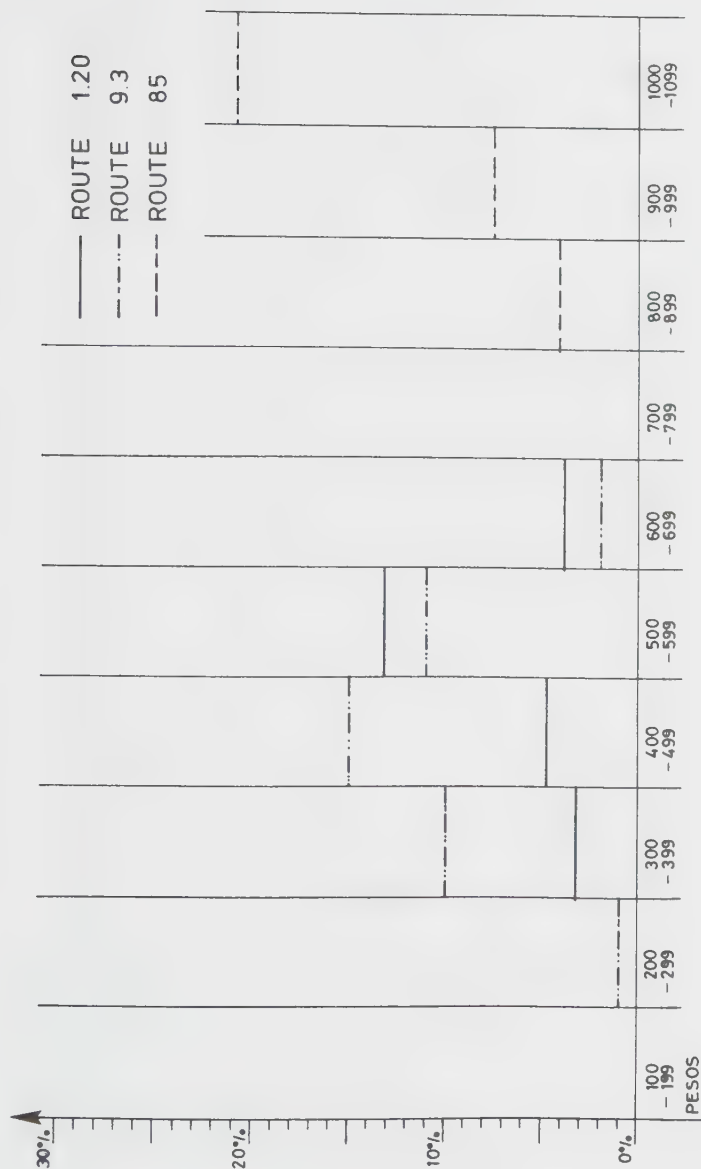
The amount of rent paid can also give insight into the attractiveness of each route. The higher daily rents paid by the Route 85 drivers (Graphs 10 and 11) are, we suggest, due to newer vehicles (Graph 8). Drivers on this route must work longer hours or move passengers more efficiently in order to earn a living above the quota paid to the owner. In the general investigation of the 19 most heavily travelled lines, the rents paid were 300 to 500 pesos per day for a saloon and 600 to 700 pesos per day for a Combi. The latter was often rented to two drivers, each paying approximately 300 pesos per shift. The average rent paid on these 19 lines was 397 pesos per day. It was felt, however, that drivers had understated the amount of rent paid, particularly as the ISTME questionnaire was conducted on behalf of a government office. The case-study route drivers, questioned with the permission and the introduction of the route president, proved the above supposition true: even the average rents on the cheapest route, 9.3, were 420 for a saloon and 910 for a Combi. These rates are 475 and 1,050 respectively for Route 1.20 and 960 and 1,600 respectively for Route 85. The few Combis rented on Route 9.3, again lead one to suppose that this route is less attractive to passengers and drivers alike.

We conclude that a high percentage of rented vehicles occurs where drivers are predominantly young. There are varying rental costs which reflect the differential attractiveness of the routes: higher costs suggest new vehicles and greater efficiency in passenger movement. The more attractive routes will use new Combis.

The registration of each car was the final detail sought in the vehicle questionnaire. Whether the car is registered can be seen by the number plate. For the period of study¹⁷⁾, official number plates were red and private plates were green. Cars with no number plate are working with a monthly permit. The percentage of registered cars in the ISTME study was a majority:

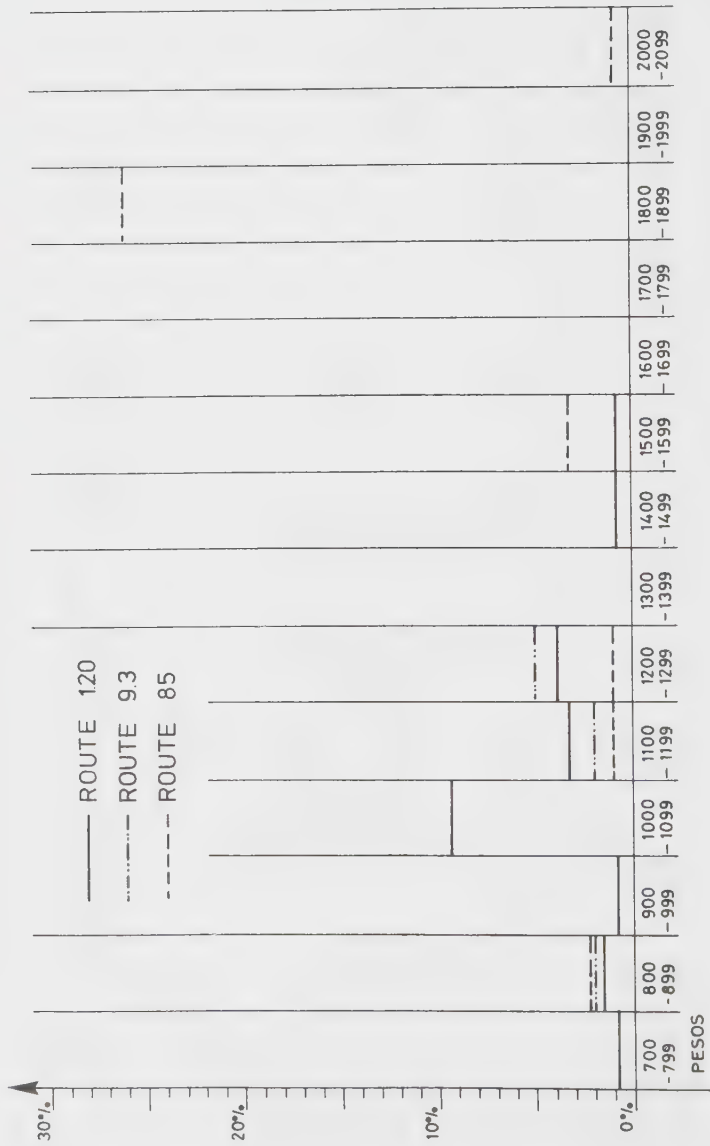
17) All number plates must be renewed at a bi-annual revision and the colour is changed every two years.

Graph 10: Rent paid for Saloon cars on the three case-study routes (1981)



See Graph 6 for questionnaire totals.

Graph 11: Rent paid for VW Combis on the three case-study routes (1981)



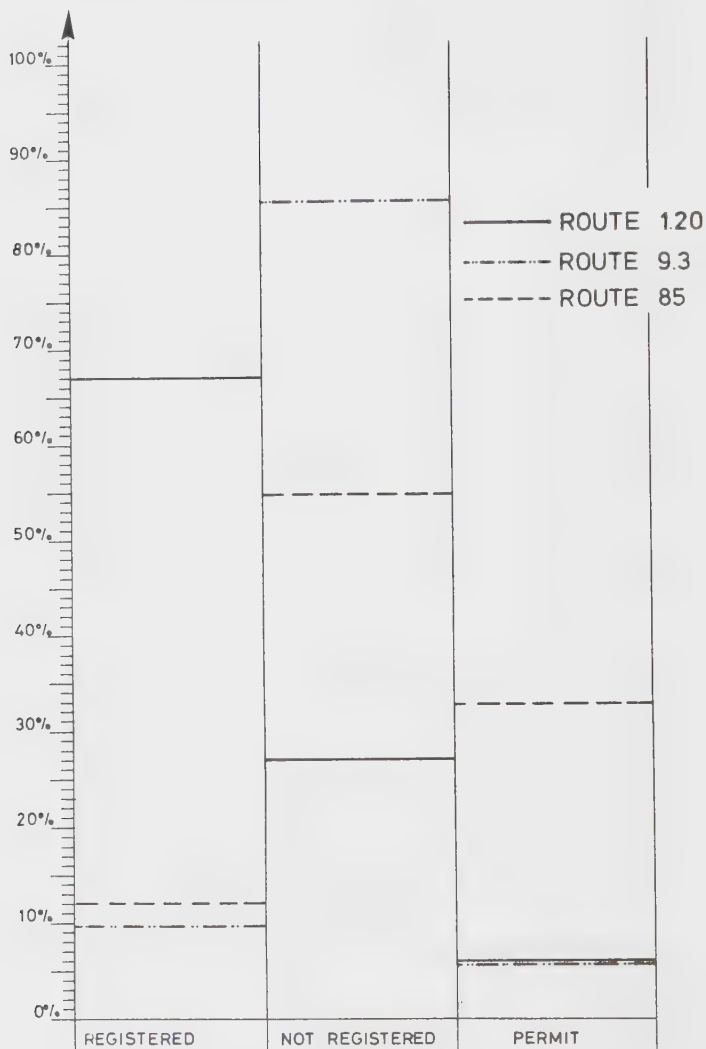
See Graph 6 for questionnaire totals.

60% had red number plates. This is to be expected when we realize that 14 of the sample 19 routes surveyed are older, long-established, registered routes and only five are newer or tolerado lines. Thus we suggest that cars are officially registered for transport use on the older routes whilst the tolerado and newer lines use vehicles that have not been registered. This supposition is supported in the case-study results, seen in Graph 12.

The vehicles used on the oldest route, 9.3, are in the majority registered: 67% have official red number plates, only 16% had no plate at all. On Route 1.20, however, a registered but still new route, 85% of cars had unofficial green number plates - only 9% were legally registered as public service vehicles. The percentage of unofficial vehicles also forms a majority on the tolerado Route 84 as 55% were travelling with a green number plate. This route has 33% of its vehicles working under monthly permit with no number plates. These vehicles are registered in the Departamento de Autotransportes y Estacionamientos (see Section 3.6), but are liable to fines on the street since they are not immediately identifiable in the case of accidents.

We can make the following conclusions: the new and tolerado routes expand, using whatever vehicles are available even if they are not registered. The cars with green number plates are usually protected by amparos but their lack of official registration means that they also escape the annual revision necessary for public service vehicles. The new and tolerado routes therefore aim to satisfy public demand rather than official regulations. The high incidence of illegal use of private cars for public service is the answer to continually increasing demand.

Graph 12: Vehicle Registration on the three case-study routes (1981)



See Graph 6 for questionnaire totals.

5.2.3 Characteristics of the drivers

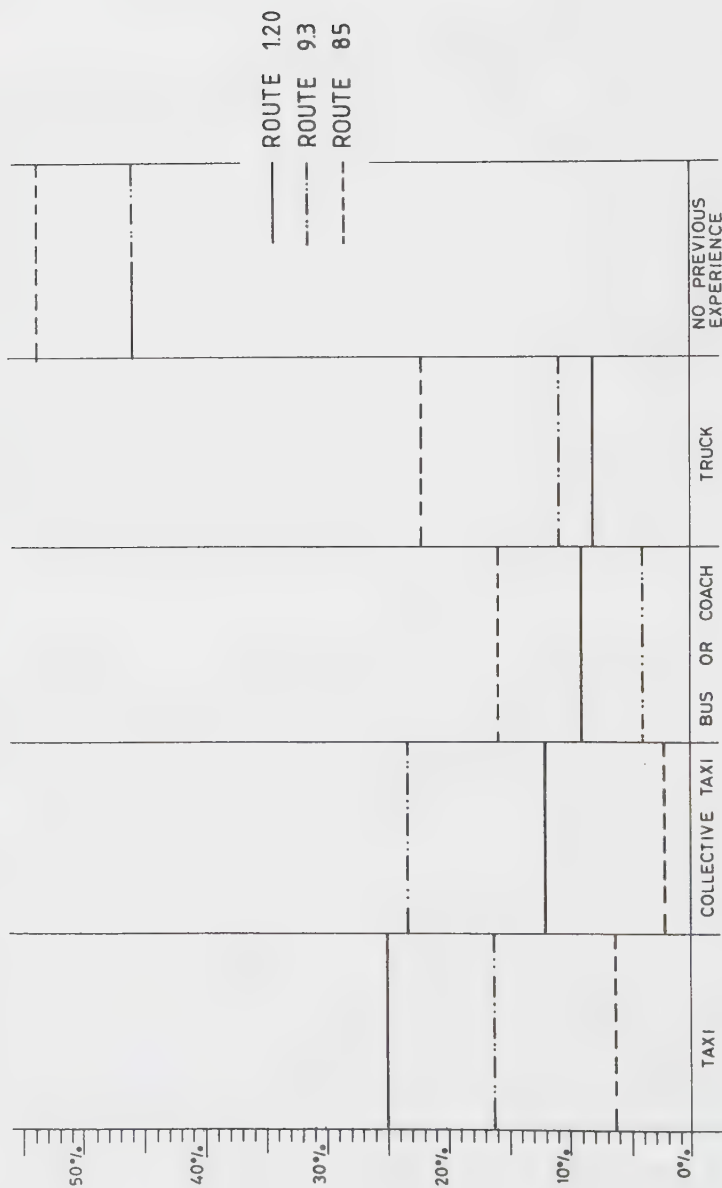
5.2.3.1 The Drivers' questionnaire

In order to form a complete picture of the service offered in the collective taxi sector, we wanted to gather information on the drivers' personal history. In the ISTME questionnaire this was limited to a question of origin - whether the driver was a native of the city or not. This question was included due to the importance of migrant workers in the paratransit sector of other cities (see, for example, GOULD: 1965, 25, on the rickshaws of India). This factor proved irrelevant, however, for the case of Mexico City since 78% of the drivers were natives of the Federal District. The case-study survey therefore concentrated on the personal histories of the drivers, both generally and as a driver on the case-study route, in order to measure their driving experience. This would influence the velocity, comfort and safety of the vehicle.

5.2.3.2 Driver experience and age

We were interested in whether drivers had driven other vehicles in the public sector. Graph 13 shows us driver experience on the three routes: 46%, 46% and 54% of drivers on routes 1.20, 9.3 and 85 respectively had no previous experience. Their experience was in taxis and collective taxis for the first two more urban based case-studies, and in buses and trucks for Route 85 whose drivers are based outside the Federal District. The above data are naturally tied up with the age of each driver. The lower percentage of driver experience on Route 85 could be a result of a slightly lower average age: 28 years old as opposed to 30 on the other two routes. The ISTME questionnaire had also revealed a higher average driver age on established registered routes than on the newer or tolerado lines. The highest average ages noted in this general survey were 42 on Route 2 and 40 on Route 66. Both these routes are registered while only one of the registered routes, number 14 (see Table 11) had

Graph 13: Driver Experience on the three case-study routes (1981)



See Graph 6 for questionnaire totals.

an average drivers' age less than the 28 years noted for Route 85.

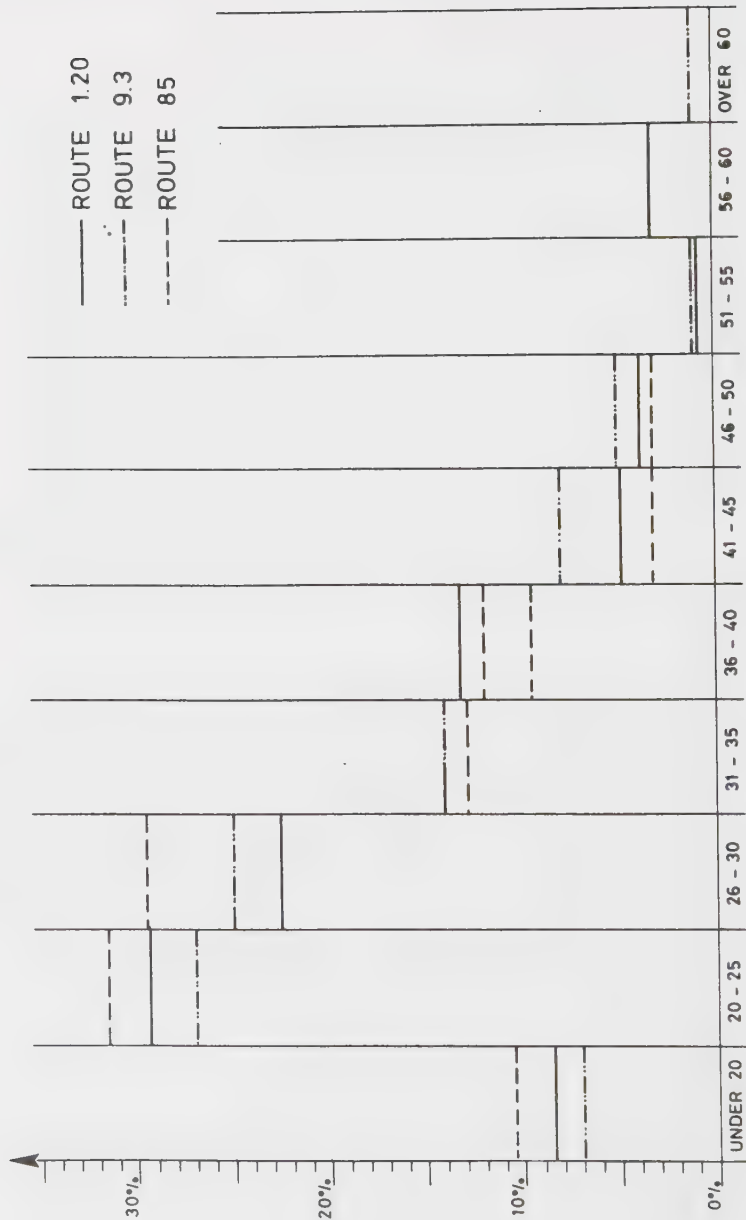
Table 11: Average Drivers' Age: sample survey 1981

Route 1: 28	Route 34: 32
Route 2: 42	Route 49: 33
Route 3: 29	Route 50: 32
Route 11: 33	Route 66: 40
Route 14: 26	Route A: 28
Route 15: 30	Route D: 32
Route 17: 31	Route F: 32
Route 20: 34	Route H: 37
Route 25: 34	Route K: 27
Route 28: 36	

Source: ISTE: 1981, Tables.

It must be remembered that these ages are for an urban area where 51% of the population is under 21 (BEAUJEU-GARNIER: 1967, 15). From the previous paragraphs, taking the tolérado routes as the newer lines, we suggest that the new lines generally use younger drivers. This is echoed in Graph 14 where, on Route 85, 42% of drivers are 25 or less, only 6% over 40 and not one of them over 50. In comparison, the older, long-established Route 9.3 has a work-force of which 15% are over 40.

Graph 14: Drivers' Ages on the three case-study routes (1981)



See Graph 6 for questionnaire totals.

5.3 The collective taxi's special service in comparison with other transport modes

5.3.1 General aspects about the passenger opinion question

We have mentioned in Chapters One and Three, the existence of other transport modes operating in Mexico City. We want here to look at the presence of these modes - the bus, Metro and private car - on the individual case-study routes, and to analyse the particular service that the collective taxi offers. We asked passengers their opinion as to the route itself. We hoped, through this question, to ascertain what is lacking in present collective taxi supply and thus to be able, in Section 6.5, to suggest how an efficient collective taxi route should be organised.

The public satisfaction question was open and answers ranged from 'magnificent' to 'terrible', but these were later grouped into three simple categories of good, regular and bad. The results are set out in Graph 15. The principle factor is the enormous difference between the one long-established line, Route 9.3, and the newer routes of 1.20 and 85. The details of vehicle age, vehicle type, ownership, route control and route expansion that we have looked at in the last two chapters explain the strikingly negative results of Route 9.3. 39% of this route's passengers put it in the category 'bad'; this is over four times greater than the equivalent category on the other two lines. We conclude that the factors of: newer cars, Combis, flexible time-tables, unofficial vehicles which allow the supply to be increased rapidly and 'despachadores' for street control (see Section 3.7) are all important for the success and efficiency of the 1.20 and 85 collective taxi routes.

The general query as to consumer preference for the collective taxi pinpointed the importance of speed and comfort

Graph 15: Public Opinion on the three case-study routes (1981)



The Results in this graph are based on the passenger questionnaires:
 Route 1.20: 416 questionnaires; Route 9.3: 300 questionnaires; Route 85: 400 questionnaires.

Table 12: Reasons for collective taxi use on the three case-study routes (1981)

Main Reason given	Route 1.20		Route 9.3		Route 85	
	No.	%	No.	%	No.	%
1. Speed	226	53.8	172	56.6	180	44.8
2. Speed and comfort	15	3.5	19	6.3	25	6.2
3. Comfort	38	9.0	45	14.8	56	13.9
4. Efficiency	9	2.1	5	1.6	24	6.0
5. No buses/Metro	39	9.2	3	1.0	15	3.7
6. Buses/Metro full	23	5.5	23	7.6	20	5.0
7. Buses/Metro/car need repairs	7	1.7	5	1.6	8	2.0
8. The taxi stops where one wants	14	3.3	2	0.6	13	3.2
9. The only possibility	19	4.5	8	2.6	18	4.5
10. Carrying luggage	5	1.2	4	1.3	14	3.5
11. Ease and Safety	12	2.9	15	4.9	26	6.5
12. Passenger tired or ill	8	1.9	2	0.6	3	0.7
13. Passenger has been paid	5	1.2	1	0.3	-	-
Total number of passengers asked	<u>420</u>		<u>304</u>		<u>402</u>	

Source: Passenger questionnaire.

(Table 12). On all routes, half of the passengers questioned (54%, 56% and 45% for Routes 1.20, 9.3 and 85 respectively) specifically mentioned the speed of the collective taxi in comparison with all other public transport modes. 9%, 14% and 14% of the passengers of 1.20, 9.3 and 85 respectively gave comfort as their reason for choosing the collective taxi, whilst 4%, 6% and 6% respectively answered that speed and comfort were together the deciding factor. Thus the higher fare of the collective taxi is transcended: though the raising of fares, particularly on the cheaper forms of transport, can bring out-

breaks of violence (UNO MAS UNO: 14/IX/1981), studies have shown (HOEY: 1976, 28) that the quality and reliability of services is more important. The International Organization of Public Transport (ULLOA: 1973, 4) determined the following factors in order of importance as deciding consumer preference: 1) frequency, 2) speed, 3) reliability, 4) fare and 5) comfort. It is simplest to look at each route in turn to compare the characteristics of the collective taxi with the particular transport mode which is also present.

5.3.2 Route 1.20

The 33 kilometers of Route 1.20 from Toreo to Cuemanco along the urban motorway, El Periferico, allow us to make a relevant comparison between the three ground level transport modes: the collective taxi, the public bus and the private car. Reference to Graph 3 shows that the Metro plays no part on this route. The bus line covering this route is particularly interesting since it is one of the original government-run routes known as Ruta 100, and it travels along exactly the same ground as the 1.20 though it was later extended to El Rosario (Map 4)¹⁸⁾. The government bus line began in 1980 running from Toreo to Cuemanco, and the original taxi line was initiated in 1979 covering the northern half of this route. The 1.20 route was extended in late 1980 southwards to Cuemanco so that for the period of questioning the two modes travelled the same distance. The collective taxi fare was (1981), however, five times higher. We want to look firstly at why the passengers themselves preferred to use the collective taxi. As to be expected, the highest value is for 'speed'. We can see that the second highest value for Route 1.20 is for 'there are no buses'. It must be explained that during the period of questioning the government brought a widely changed routing system for the whole city into being¹⁹⁾, and many passengers were unaware

18) From 8/XII/1981.

19) El Red Ortogonal.

of the new routes²⁰⁾. The value is nevertheless high: 'no buses' does not mean that the passengers do not know of the Ruta 100 line but that the buses do not arrive or that there is no room on the buses that do pass. This is echoed in the response 'it (the collective taxi) is the only transport mode'. The third and fourth highest values in this table - the 9% of responses under the reason 'it is more comfortable' and the 5.5% answering that 'the buses are full', also refer to the preference of the collective taxi over the bus. The comfort of the collective taxi is due to a guaranteed seat. On full buses, with 35 seats, there are usually as many passengers standing as sitting. Entering the bus at the terminal does not guarantee a seat, and even sitting is not comfortable when there are so many standing passengers.

In Chapter Three, we mentioned the importance to the passenger of the speed of the collective taxi. Again this is relative to the speed of the public bus, and can be based on three reasons. Firstly, a bus carrying 50 to 100 passengers must stop more frequently than a car carrying 5 to 10. The Toreo - Cuemanco bus route has 42 stops; the collective taxi saloon for five passengers transports, with those passengers who only travel part of the route, an average of ten passengers, stopping therefore a maximum of 20 times. Secondly, the size of a bus makes it less manoeuvrable than a saloon car, and the flexibility of collective taxi routing means that the driver can spontaneously change his course in order to avoid a traffic jam. Average route times are 1 1/2 hours for the bus and 1 hour for the collective taxi. Lastly, the fact that a collective taxi driver is personally affected economically by the amount of passengers that he transports whilst the bus driver is paid a basic wage means that the collective taxi will move as quickly as possible: this does not aid safety but it does provide the speed that passengers desire. The collective taxi passengers, on Route 1.20 particularly, pay for the comfort and speed that they cannot expect from the bus service.

20) UNO MAS UNO: 12/XII/1981.

Since the 1.20 route is on an urban motorway, it is necessary to mention the private car as an alternative means of transport. In urban areas outside Mexico (see Section 6.5.3) it is hoped that paratransit modes will provide an incentive to move away from private transport. In Mexico, if the collective taxi were supported, Route 1.20 could provide a valid example of the comfort of a car without the chore of driving. However, at present, though the percentage of daily transport by private means is low²¹⁾, those who own a car, use it. It is important to remember the question of status in investigating transport usage: just as the private car is a status symbol, so the collective taxi carries more status than the local bus. 1% of the interviewees explained that they were using the collective taxi whilst their own car was being repaired: we suggest that very few car owners in Mexico choose to use public transport.

5.3.3 Route 9.3

The route from Zaragoza Metro station to Netzahualcóyotl is also covered by three bus companies²²⁾. Table 12 shows us why those travellers questioned on this route prefer the collective taxi. Again we see the importance of speed: over half of those questioned gave this as their main reason, and almost 15% chose the collective taxi for comfort. Also significant are the 5% who prefer the collective taxis due to reasons of 'safety': closer questioning revealed that this is not safety from road accidents but from thieves stealing purses on crowded buses. Apart from this particular characteristic, the collective taxi is preferred for the same reasons as those described for Route 1.20 - comfort is even more important here due to the discomfort of the second class local buses. The collec-

21) 20% (COMISION DE VIALIDAD Y TRANSPORTES: 1981, 6).

22) These companies have 744 vehicles, half of which are second class buses (1981).

tive taxi service of Route 9.3 is faster and more comfortable, thus passengers pay two to five times more for it than for the bus.

Questioning at bus-stops on Routes 1.20 and 9.3²³⁾ revealed that travellers would take a collective taxi when two or more buses had passed that were unable to take more passengers. It must be remembered that while approximately 10% of travellers use collective taxis in Mexico City, almost 50% use public buses.

5.3.4 Route 85

The alternative mode of transport available on the Candelaria to Ozumba route is a long-distance coach. These coaches leave from a central coach terminal at half hourly intervals. Only the second class coaches go as far as Ozumba, and this journey costs 30 pesos in comparison to 50 pesos for the collective taxi. Waiting time plus travel time for the journey is an average 2 3/4 to 3 hours. The collective taxi waiting time is varied but a daily average is 30 minutes plus 1 1/4 hours travelling time. Thus in the areas of speed and fares, the collective taxi passengers pay 20 pesos more and save an average of one hour each way. Comfort is also important in comparison with the second class coach. The 'safer' reason is again significant - here though because of careless driving: many passengers questioned mentioned the high accident rate of the Cristobal Colon coaches.

5.3.5 Conclusions on the success of the collective taxi service

On the three routes studied, a comparison of the collective taxi with the Metro was not possible since either the Metro did not exist in this area (Route 1.20) or it had been used to arrive at the collective taxi terminal (Routes 9.3 and 85).

23) Random questioning not tabulated.

The collective taxi is therefore not competing with the Metro system in these examples but is complementing it, acting as a feeder system which collects or disperses passengers beyond the extent of the Metro line.

We can see from the above paragraph the service of the collective taxi sector in comparison with that of the local, long-distance or government run bus systems. No one denies that the bus can carry more passengers, but the collective taxi service is faster, more comfortable, safer and more personalised, independent of the distance being travelled. The service is also more flexible, adjusting its hours and routeing to the demands of its passengers. Flexibility is particularly important in a city growing so quickly: in 1977, the government transport bureau estimated that the urban area generated a total of 16 million journeys per day (by public and private means) of an average 7.5 kilometers in length. In 1981, these were estimated to be 18.4 million per day, the majority being more than 10 kilometers in length²⁴). In 1977, the collective taxi service moved 3% of the daily load (51% travelled by bus); in 1981 10% travelled by collective taxi (49% by bus) with an increase of over 500% in the number of vehicles in the service. Almost half of those passengers travelling in Mexico City use the bus daily however: they may only use the collective taxi in the morning, when they are particularly rushed or because it is the mode which arrived first. Many passengers replied that they use the collective taxi 'only sometimes', 'depending upon the traffic' and 'if the bus is full'. Thus we see that the role of the collective taxi is one of either complementing existing networks or serving new ground until the bus system network arrives.

To illustrate the large measure of success of collective taxis in Mexico City, we conclude this section with a quote from DICK (1981a, 70). It was written about the paratransit of Jakarta but is also true for Mexico City:

24) COMISION DE VIALIDAD Y TRANSPORTES: 1981, 6.

"The persistence of these ... jitneys over the past half century suggests that they hold definite advantages over other forms of public transport, at least to some consumers.

Jitneys have survived ... without any assistance from the government and despite the subsidisation of competing modes. Compared with trams or buses, jitneys are more frequent, faster, stop anywhere along a route and carry only seated passengers."

In the last chapter we make some final conclusions and try to answer our three hypotheses. We also look at the future for collective taxi routes in Mexico City and at how such routes could be efficiently set up in other urban areas.

Chapter Six: The present and future positions of the collective taxi within the urban framework: conclusions

6.1 Introduction

Having looked at the growth and organisation of one example of paratransit, we would like in this chapter to analyse the position of paratransit within the urban framework and to look particularly at its possible role in the future. We again take Mexico City as a point of reference describing the collective taxi's interaction with the total transport network and the provision made for this mode in Mexico City's plans for the future. We then look at future roles for paratransit generally in Third and First World cities.

The case-studies investigated in Chapters Four and Five can provide insight into how, and how not, to set up paratransit systems, and whether these systems should replace or run alongside present transport supply. We hope to use this information in the last section of the chapter in order to outline the creation of an efficient paratransit supply.

6.2 The collective taxi within Mexico City's transit network

We looked at the overlapping of bus and collective taxi supply on the three case-study routes in Chapter Five. Here we would like to compare the collective taxi system with the transport network as a whole. The collective taxi sector can best be understood when we think of it as an express service - more direct and more personal - for which the passenger pays more. Thus the sector adds a further dimension to present transport supply rather than duplicating existing services, and it uses

the infrastructure already available. Demand increases more quickly than new infrastructure can be supplied, leading to commuting problems in Mexico City not just at rush hours but through the majority of the day. Thus the collective taxi has arisen alongside bus and Metro services, to cope with demand.

6.2.1 A comparison with the bus service

We compare the collective taxi firstly with the bus network, shown on Map 10. A comparison of Map 10 with Map 4 shows the overlap of these two systems. Buses carry the bulk of the movement, leading to the conclusion that regular transit buses will continue to offer the largest number of seats in the near future, whilst 'demand-responsive' or paratransit services fill out the gaps left by poor urban planning (BOWES: 1970, 288). Bus routes extended with the growth of the city, and since Mexico City growth has been unplanned, the routing is primarily anarchic. As with most services in Mexico City, there is distinct polarization (SUTHERLAND: 1978, 60), with the majority of bus lines duplicating routes and competing with each other (INGENIEROS CIVILES ASOC: 1976, 11). Thus, inside the centre, the collective taxi increases the number of public transport seats available and outside the city centre they are a response to too few bus lines. Both bus and collective taxi systems were established to resolve an immediate necessity - buses due to the physical growth of the city and collective taxis due to the "continual cutting of services, irregular timetables, changing fares and badly maintained vehicles of the bus network" (DEPARTAMENTO DE AUTOTRANSPORTE Y ESTACIONAMIENTO: 1981, 41-42). Data collection in 1980 (ISTME: 1980, 33) showed 3.5 bus seats compared to 13.9 collective taxi seats per 1,000 inhabitants for the Metropolitan Area of Mexico City.

An interesting factor in the comparison of bus and collective taxi sectors in Mexico City is the great difference in the service offer

although the two run side by side. Particularly important are economic factors. Economic considerations must be based on the fact that the bus is a publicly run, subsidised service whilst the collective taxi depends upon efficiency. On one hand this disadvantages the collective taxi sector - vehicles "run races in order to win passengers" (EXCELSIOR: 17/XI/1972, 27) and the average 300 kilometers covered daily by a saloon carrying five or six passengers ruins the vehicles. Collective taxi operations have to be profitable due to their entrepreneurial nature, even if this profit is achieved through long working hours, overloading vehicles and cost-cutting on repairs and insurance. However, collective taxis also work in outer areas where there are no bus lines and at hours when there are no buses - there is evidence of students, farmers and factory workers paying the collective taxi rate for a service that the bus does not provide (UNO MAS UNO: 10/XI/1981, 25). In fact the ISTME report concluded that "the collective taxi service operates with good financial results" (ISTME: 1981, 31), working as an adjunct to the bus service rather than as a competitor.

6.2.2 A comparison with the Metro and the private car

Let us compare also the service offered by the Metro. In Chapters Three and Four, we mentioned the role of the taxi as a feeder to the Metro network, and the 61% of collective taxi termini situated at Metro stations shows paratransit as a complement to existing underground lines. The slow, limited and expensive growth of an underground system puts it at a disadvantage in a rapidly expanding city. The Metro's planned 230 kilometer network of 21 lines by 2010 would make it the biggest in the world, but the government transport office, COVITUR, has warned that "total integration of the Metro will only answer 50% of the problems" (UNO MAS UNO: 9/III/1981, 35), and that "emergency measures" of which collective taxis have always been part, must be continued. This paratransit mode is particularly labour, rather than capital, intensive:

its use of the available infrastructure in Mexico City compares well with the Metro's high financial needs, though this situation is reversed in the case of fares.

We must also mention the role of the collective taxi in relation to the private car, and the importance of the status of not using public transport modes. Too few authors and planners examining public transport mention the role of status. A basic problem in Mexico City is that 2 million of the 2 1/2 million vehicles on the roads are private cars; this stems from the high status of the automobile. The flexibility of the car, joined with the poor reputation of buses in the city has assured collective taxi use.

Thus, although illegal, the collective taxi in Mexico fulfills a function that, at the moment, is impossible to cover with other services. With at present 20% of inhabitants travelling up to 5 hours a day (UNO MAS UNO: 20/VIII/1981, 7), we conclude that this paratransit service has a role operating alongside bus and Metro systems, complementing them both.

6.3 Conclusions as to the three hypotheses

6.3.1 Collective taxis are a Third World phenomenon

A further look at Map 6 shows the predominance of the collective taxi and non-motorised forms of paratransit in the Third World. Other forms of paratransit, such as car-pooling and dial-a-bus however, are only working outside the Third World. It does seem true that well developed informal transport sectors will only be found in the urban areas of non-industrialized countries. An interesting example is that of Johannesburg: a working collective truck sector is in existence but only for black passengers. The black residents form perhaps a Third World enclave within an industrialized urban area. Thus, at present,

informal paratransit only flourishes in non-industrialized countries. Transport planners in both industrialized and non-industrialized countries are working, however, to reverse this situation. Those of the Third World urban areas we have described are predominantly against informal transport whilst those of Europe and the United States are interested in introducing paratransit into their cities. The difference lies in the present uncontrolled growth and often illegal service in informal transport sectors of the Third World.

6.3.2 Collective taxis develop as an answer to increased demand

A further characteristic of the collective taxi sectors described in Chapter Two is that they developed predominantly as interim measures to answer an increasing demand. In Latin America, Indonesia and the Philippines, collective taxi routes began predominantly after the Second World War when the mobilisation of population caused urban in-migration. The collective taxi alternative was an answer to increased urban demand. In most cases the mode developed spontaneously, without government backing or organisation, and it is therefore very flexible. This characteristic allows the collective taxi to adapt timetables, routes and number of vehicles to public demand. Public demand as described in Chapter Four is therefore the main factor influencing this sector.

6.3.3 The collective taxi system supplies a specialized service

We have seen in this chapter that the collective taxi runs successfully alongside the traditional transport modes. This is due to the particular service that it supplies. In Chapter Five we looked at the characteristics of the service and saw why the informal transit systems throughout the world are popular with the public. The factors of speed, comfort, flexibility and easy stopping provide a specialized service which is

frequently two to five times more expensive than the bus or underground. Since the supply from the collective taxi sector adapts itself over time, newer routes are more successful than older ones.

6.4 Transport planning for the future in Mexico City

Though tolerated at present - the collective taxi is "not seen" by the government (EXCELSIOR: 17/XI/1972, 21) - government policy enforcement is important for the collective taxi and the mode is not included in future plans. At the time of the case-study investigation, transport planning was bound by the Master Plan for Transport, ratified in February 1980. This plan stresses the continued extension of the Metro system towards its 21 lines in 2010 and an increase in underground travel from 11 to 19% of the whole. Though this would seem to support the collective taxi due to the latter's role as a feeder to the Metro system, the plan advocates a reduction in the percentage of travellers moved by all forms of taxi from 13 to 8% (UNO MAS UNO: 14/XI/1981, 81, Suplemento 4). The "feeding" should be done by trams and trolleybuses with a rise in user percentage from 4 to 28%. There is continued emphasis on public transport since though the importance of the bus would lessen, it is hoped to reduce private transport's use from 30 to 20% of the total. The plan does not establish how this is to be done, and without disincentives for car use these policies are probably not enough to get the driver out of his private car. Industrial planning still includes a large automobile manufacturing sector, and Mexico remains the largest import market for Chrysler's large saloon cars. The three major aims of the Master Plan are: better use of present infrastructure, improved accessibility to work places, and conservation of the environment.

The body overseeing government transport plans is the Vocalia Ejecutiva de COVITUR, and their position was analysed from ar-

articles²⁵⁾ and from an interview with Arq. Hugo Gonzales²⁶⁾, technical director of COVITUR. This organisation also stresses the importance of aiding public rather than private transport, again supporting the use of trolleybuses. Also mentioned for the future is "the operation of collective vehicles of intermediate capacity (microbuses) in low density zones" (COVITUR: 1981, 11). Arq. Gonzales elaborated on this idea suggesting that government-run microbuses would eliminate the "disorganization" of the present collective taxi system. The relative success of the Combi within the collective taxi sector could substantiate this argument. The bus network remains an important part of future transport plans. The Commission states that, with sufficient government support - started with the municipalization of the buses in September 1981 - this network would take over collective taxi passengers, and the paratransit vehicles would eventually disappear. Arq. Gonzales is against the further tolerance of the collective taxi sector due to the anarchic nature of the routes and the bad state of repair of many of the vehicles; more importantly, the government body maintains that public transport should be a centrally run public service rather than a business.

The Department of Police and Transit, dealing with the practical nature of routeing and vehicle maintenance, also underlined the preference for buses over collective taxis²⁷⁾. The policy of this department is to reduce the number of illegal collective taxi vehicles through the awarding of licenses from the Legal Offices of the Police Department. The head of this department felt however that future guidelines should be stricter in order to lower the number of collective taxi routes, with a simultaneous improvement in bus standards.

25) Principally COVITUR, "El sistema de transporte en la Ciudad de Mexico" Primer Congreso Internacional de Planeacion de Ciudades Grandes, Mexico, June 1981.

26) Interviewed 17/XI/1981; see Appendix 3.

27) Lic. Osegura, head of the Legal Department, Department of Police and Transit, interviewed 27/XI/1981.

There is, therefore, no Mexico government backing for the collective taxi of the future. It must be remembered that transport policy in Mexico City is often of the 'fix-it' or remedial type (SUTHERLAND: 1978, 101): the collective taxi arose to offer a more adaptable and rapid service to its users and to increase transport supply - if demand can, or could in the future, be satisfied with bus and Metro seats alone, then the 'temporary' measure of collective taxis may be superceded. It must be stressed, however, that the present situation, particularly from the public viewpoint, furthers the use of the collective taxi. Throughout paratransit analysis (see Chapter Two) we have noted that the government is against the mode and the public for it. In the following paragraphs we would like to examine the disadvantages raised by government offices and then turn to the advantages of the collective taxi in urban traffic. With the help of a flow chart we hope to describe why the paratransit sector is successful in Mexico City and how it could fill urban transport needs in other urban areas.

6.5 The future of the collective taxi in other urban areas

We would like to enumerate the particular characteristics of a collective taxi sector, as a basis for how this sector can aid urban transport in general. We have deduced in above paragraphs that paratransit need not supplant existing transport modes but that it can complement the network already in use. We suggest that the collective taxi should be supported where it is already available or be added to the transport network existent.

6.5.1 The advantages and disadvantages of paratransit as seen in urban Mexico City

We have seen disadvantages in the system of collective taxis, especially in the way in which it is run in Mexico City. These are principally:

- 1) Greater pollution and more petrol consumption per passenger than with the bus;
- 2) Its reputation as an unplanned 'poor man's technology';
- 3) Continual stopping and starting plus competition with other public vehicles adding to congestion and a high accident rate. In Mexico City in particular, disadvantages are:
 - 4) The lack of legislation governing the sector leaves the driver and the passenger unprotected - the former with no social security or holidays etc., and the latter with no accident insurance or recourse to appeal, and lastly;
 - 5) The control of the system is patchy, leading to overcharging and a lack of responsibility amongst drivers. These disadvantages stem principally from the system's spontaneous growth and from the operators' weak position politically.

To sum up: in Mexico City, the collective taxi sector seems to be a good idea, badly carried out. It is a flexible demand-responsive system acting outside the law and beyond the quality and safety controls that lawfulness could enforce. Stronger policing and the impounding of vehicles rather than fining drivers, could overcome many of the 'illegality' problems. In Mexico City, the government 'tolerates' rather than 'uses' the collective taxi system. We feel, however, that the mode should be used to 'help out' in two sectors: relieving central demand in peak hours, and working more efficiently in low density areas or low demand hours.

Let us now run through the particular characteristics that we have isolated as representing paratransit, to ascertain the advantages of the system. The characteristics favouring its use are:

- 1) Ease of entry for setting up the mode itself and for the addition of further vehicles as demand increases; the service is thus usable at each stage of its development;
- 2) The operation is labour-intensive;

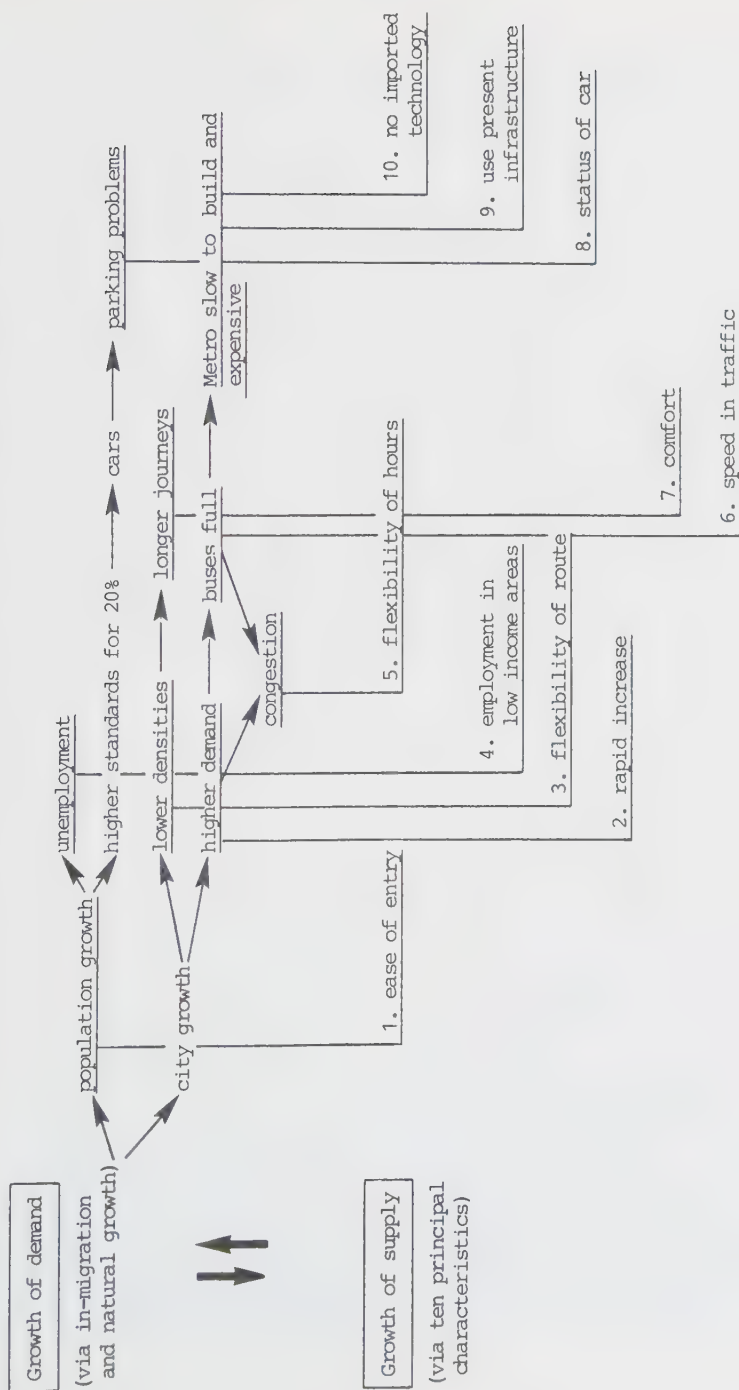
- 3) Flexibility in three spheres: flexible hours to cope with particular problems day to day, flexibility in re-routeing in the case of congestion or of extending physical growth, and flexibility of the vehicle itself in traffic;
- 4) The privacy of a car without the need for a parking space;
- 5) An important source of employment;
- 6) Better usage of the existing infrastructure;
- 7) Being demand-responsive allows for better load factors than a fixed time-table system;
- 8) Better designed to serve the 20th century trend of lower densities in urban areas;
- 9) Lower passenger numbers mean fewer stops than with traditional public transport;
- 10) No need to use (or import) expensive high technology;
- 11) Good service to a local community especially through those routes from a rural area into the city, and lastly;
- 12) Relative comfort as all passengers travel seated.

From the flow chart Table 13 we conclude that ten major advantages of the collective taxi adequately answer growth in transport demand. Though this table refers to Mexico City, the inherent advantages described are useful to other Third and First World cities.

6.5.2 Future paratransit in the Third World

We concluded in Section 6.3.1 that the paratransit mode is most common in the Third World. This is a result of the relatively well developed informal sectors in these areas and the unrestricted or uncontrolled markets that allow paratransit entry. These modes are based on local consumer preference with fares rising in line with inflation and routes often being the only connection between squatter settlements and the centre. Collective transport is important in Third World areas - it is a growing business in most Third World cities (FOURACRE: 1977, 1) - and paratransit systems are competitive. City growth, extending outwards rather than upwards, is better catered for by these lower capacity vehicles.

Table 13: The collective taxi as an answer to growth in transport demand (the example of Mexico City)



However, as we have seen in Mexico City, planners are loath to accept the role that paratransit plays. Mexico City plans are typical in this aspect to those of other Third World cities, with paratransit being reduced or replaced in the future. The Minibuses of Kingston, the Bemo of Indonesia and the Jeepneys of Manila are being phased out as they are "reminders of under-development" (DICK: 1981b, 73): modes with an air of improvisation about them. There are operators who clearly see transport as a business, overloading their vehicles, driving dangerously fast in city streets and ignoring fare regulations. Higher fares and lack of subsidies make for the competitive and middle-class oriented characteristic of the collective taxi - the mode provides a bought transport service rather than a means to social equity. Only in Chiang-Mai and Kuala Lumpur (see Chapter Two), where the systems are legally government-run, are paratransit vehicles part of the future. Perhaps lawfulness and government control are therefore major factors for the future social and economic success of these forms?

6.5.3 Future paratransit in First World cities

We have seen that paratransit forms in the developed world are as yet small scale, although the original jitney was successful between 1914 and 1916. On the European continent these forms are rare, whilst in the United States car-pooling, shared-ride taxis and dial-a-ride systems are slowly expanding. The possibilities for paratransit are, however, being investigated by planning offices in the United States, as opposed to their being phased out by the planners of the Third World. Since the second half of the 1970s planners have questioned the wisdom of building high capacity rapid transit when lower capacity fine mesh networks could help spread rather than concentrate traffic pressures. Only very densely populated cities can justify the expense of subway building: BART is now picturesquely described as "throwing enormous amounts of money

into huge holes in the ground" (SKRENTNY: 1981, 126). Planners cannot chase urban sprawl with an underground system.

Since the 1950s much of United States' urban transport investment has been on roads, and paratransit services can use this infrastructure. The major problem here, as in the Third World, is getting the driver out of his private car. Faced with petrol embargoes and parking problems, the private car sector reacts with smaller cars, parking on the pavement and occasional car-pooling. Future plans must go beyond car-pools however, as few of these arrangements contain more than two occupants. Car-pools are also particularly inflexible since the service is offered only once a day into town and once out of town, plus the fact that the car-owner still has to park at his destination.

Planners are waiting therefore for a relaxation of present United States' anti-jitney regulations and hoping the paratransit will attract riders from private automobiles rather than from amongst transit passengers. Average private car occupancy during urban peak hours in the United States is less than 1.5 people (KORNHAUSER, MOTTOLA and STEPHENSON: 1976, 44), with 33 passenger miles per gallon of fuel (OWEN: 1978, 314) as opposed to 95 passenger miles for a city bus in rush hour and 100 passenger miles for a small car with four passengers. Most efficient is the microbus (7 passengers) which travels 375 passenger miles per gallon of fuel. The future for paratransit in the urban areas of the United States, and, increasingly, Great Britain, lies therefore not in car-pooling but in an extension of those services mentioned in Section 2.1.3 and in assuming that metropolitan areas will extend outwards at lower densities. Subsidies are, since 1973, available to American planners for the extension of demand-responsive transport.

We can see from the above two sections that the emphasis on paratransit in the future is likely to shift from Third to First World cities as planners in the Third World restrict the informal nature of transport supply and those of the de-

veloped world attempt to repress private car use and integrate lower capacity public vehicles into the transit sector.

6.6 The creation of an efficient paratransit system

What pointers can the investigation of Mexico City's taxi sector give us in the setting up of a workable paratransit system? We have seen that this transport form works best when it is allowed freedom to be shaped by consumer preference but is also subject to quality and safety control. Freedom concerns allowing each type of vehicle to find its competitive niche in the system and legalising the one alternative to the private car that is capable of point-to-point service. Control takes the form of enforcing a special driving test, a licence fee, the payment of tax for the wear and tear to public streets and the holding of liability or accident insurance. These controls can be principally based on those in the traditional taxi industry with added safety and traffic regulations. Equally important is the protection of the paratransit vehicle from congestion, with the use of restrictions against single-occupant autos, particularly in rush hours. The aim of these restrictions is to raise occupancy rates in cars and to cause those journeys which are unimportant to be made outside peak hours. Of disincentives, petrol rationing for private cars is the most significant (BRUGGMAN and RUBIN: 1976, 36; HOEY and LEVINSON: 1977, 4).

All urban areas contain diverse markets for transport service, diverse within the metropolitan area and with diverse demands throughout the day. Thus the paratransit sector should form just part of the whole transport supply as no single mode is versatile enough to serve all functions. In general, high ridership densities can best be served by fixed route, fixed schedule systems. At present this refers to peak hours so long as there is no staggering of work hours, and in city

centres so long as the CBD continues to exist. This fixed system needs however to be supplemented by a flexible, demand-responsive network for lower densities, for non-peak hours or as a back-up to relieve congestion. Important is the blending and matching of all modes of public transport available, preferably with one central operation base for both traditional transit and paratransit, to ease co-ordination. To be avoided is the competition between systems and between individual vehicles that leads to regulation abuse and accidents in Mexico City.

To more basic details - in order to set up the paratransit sector, an obvious source of entrepreneurs are bus drivers, particularly of those routes which are at present unprofitable due to low ridership densities. Fares require further study since the paratransit service can range from a profitmaking business to a tax-supported social service programme - the fares levied depend ultimately upon the economic standing of the government in control. It must be remembered that our studies have shown fares to be a secondary consideration - one report (MUNDY: 1976, 73) has calculated that if public transport were free in the United States only 13.8% of automobile work trips would be diverted to public modes. It is possible that allowing fares to fluctuate according to demand is most true to the character of demand-responsive transport. More important than fares are speeds and frequencies. The basic task in controlling a paratransit sector is allowing it flexibility to mould itself to public demand in routeing and scheduling without sacrificing entirely the efficiencies of large-scale operations.

To sum up: we conclude that for Mexico City and for other urban areas in the future, a competitive mix of co-ordinated paratransit and conventional transit services is the most efficient transport system. A legal paratransit system can be integrated into the existing transport supply at a low cost, it does not jeopardise the implementation of future transport systems, and it is able to work in close partnership with bus and rail lines, complementing them in areas of high density and supplementing them on the periphery.

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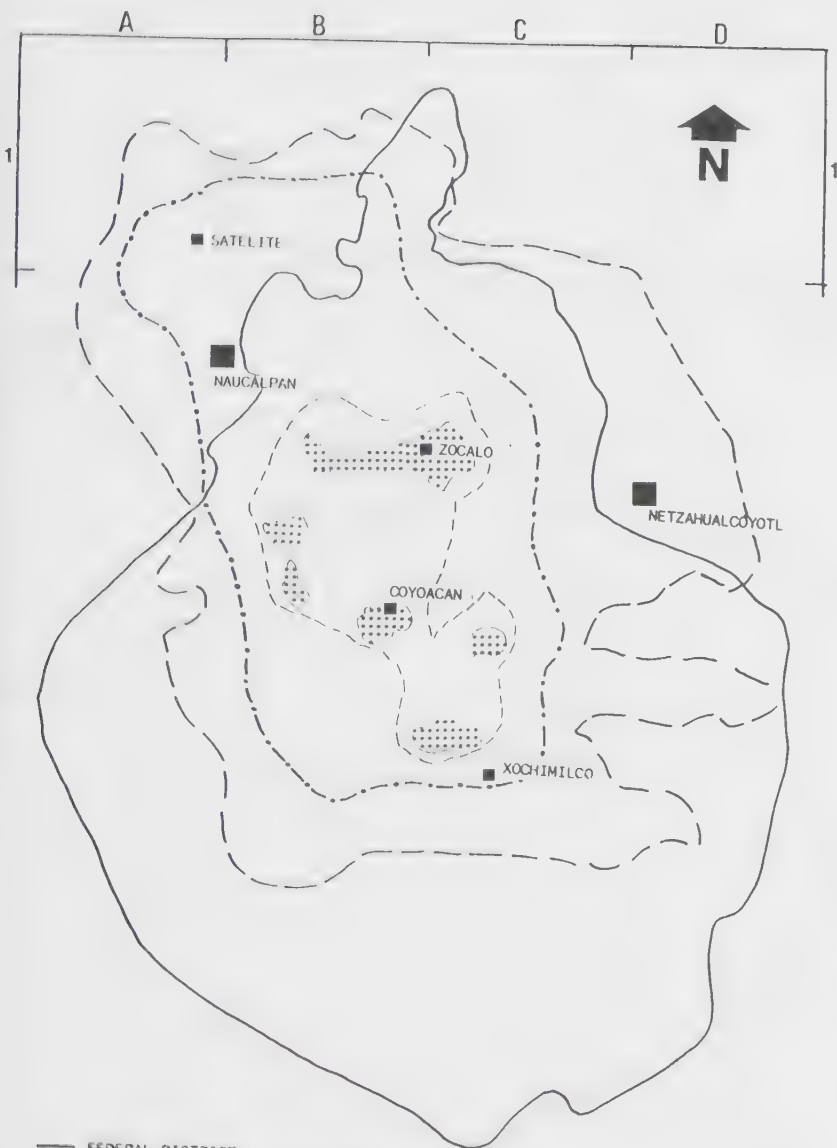
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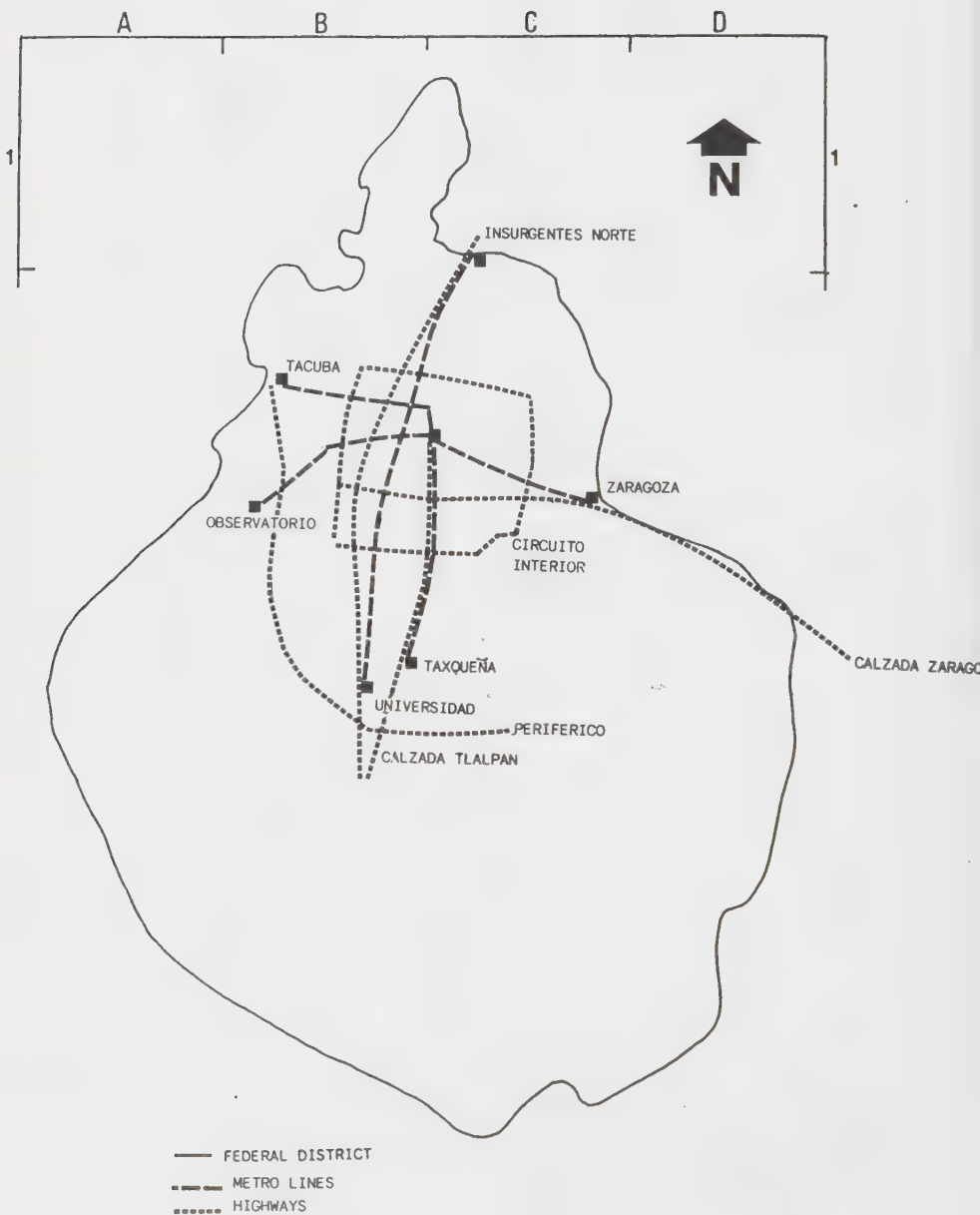
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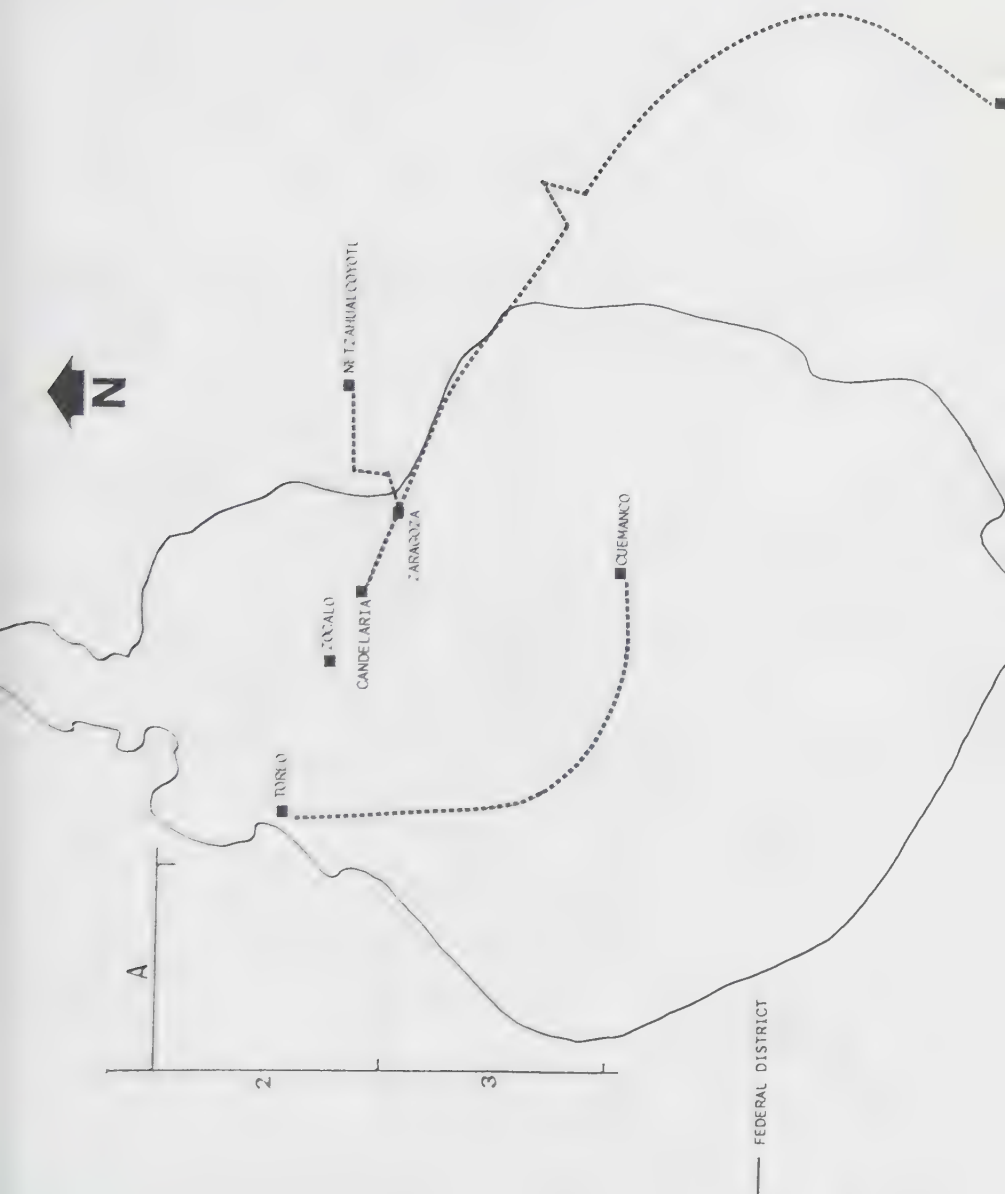
Maps

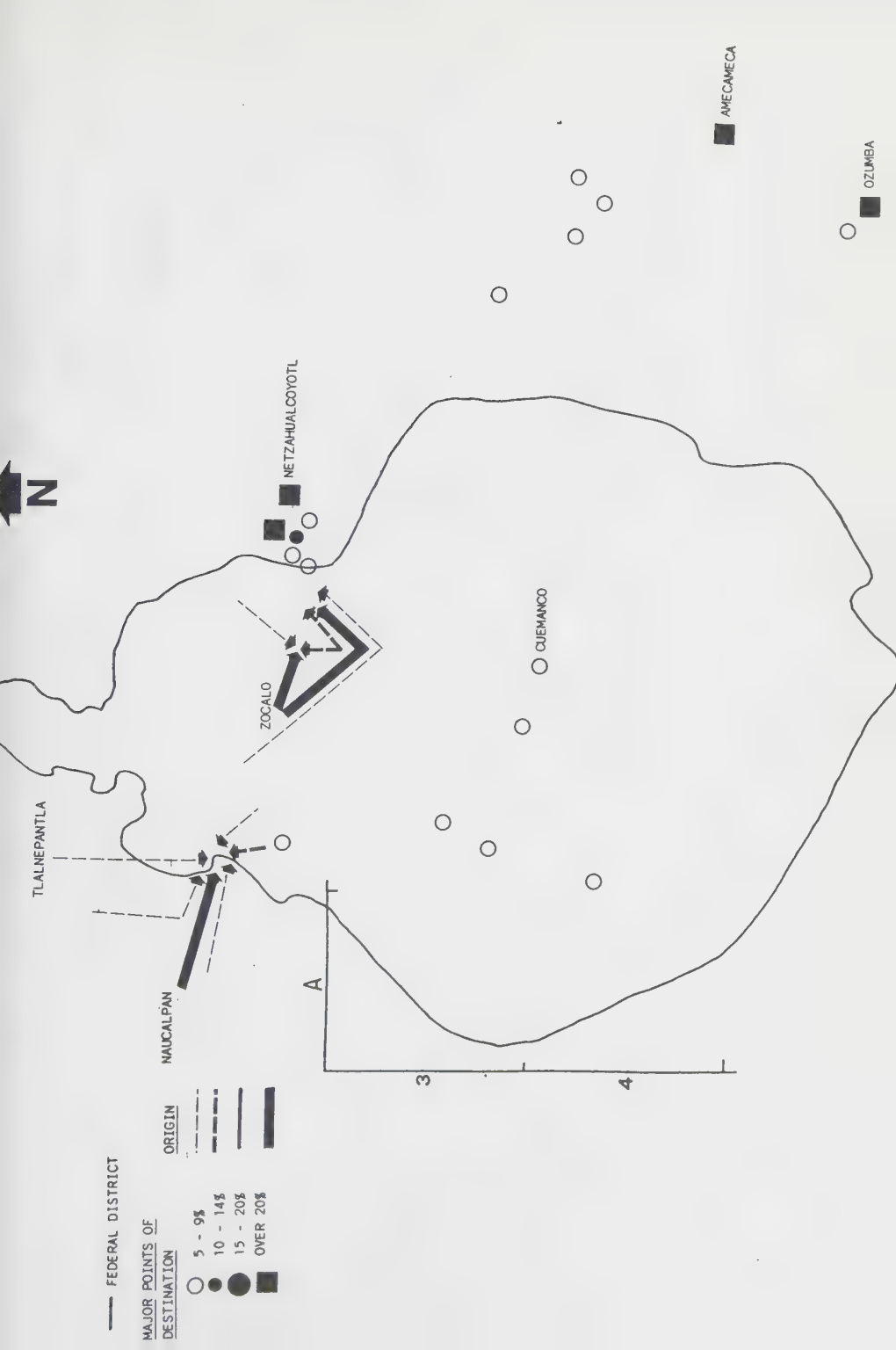
Map 1*	Orientation and Relief: Mexico City
Map 2	Mexico City Growth: 1910 to 1980
Map 3	Transport Infrastructure: Mexico City
Map 4	Collective Taxi Lines: 1981
Map 5	The Case-Study Routes
Map 6	Paratransit: A World Study
Map 7	Origin and Destination: The Case-Study Routes
Map 8	Collective Taxi Routes with over 75% of Journeys Work-Motivated
Map 9	The ten longest Collective Taxi Routes: Mexico City 1981
Map 10*	The Bus Network: Mexico City 1981

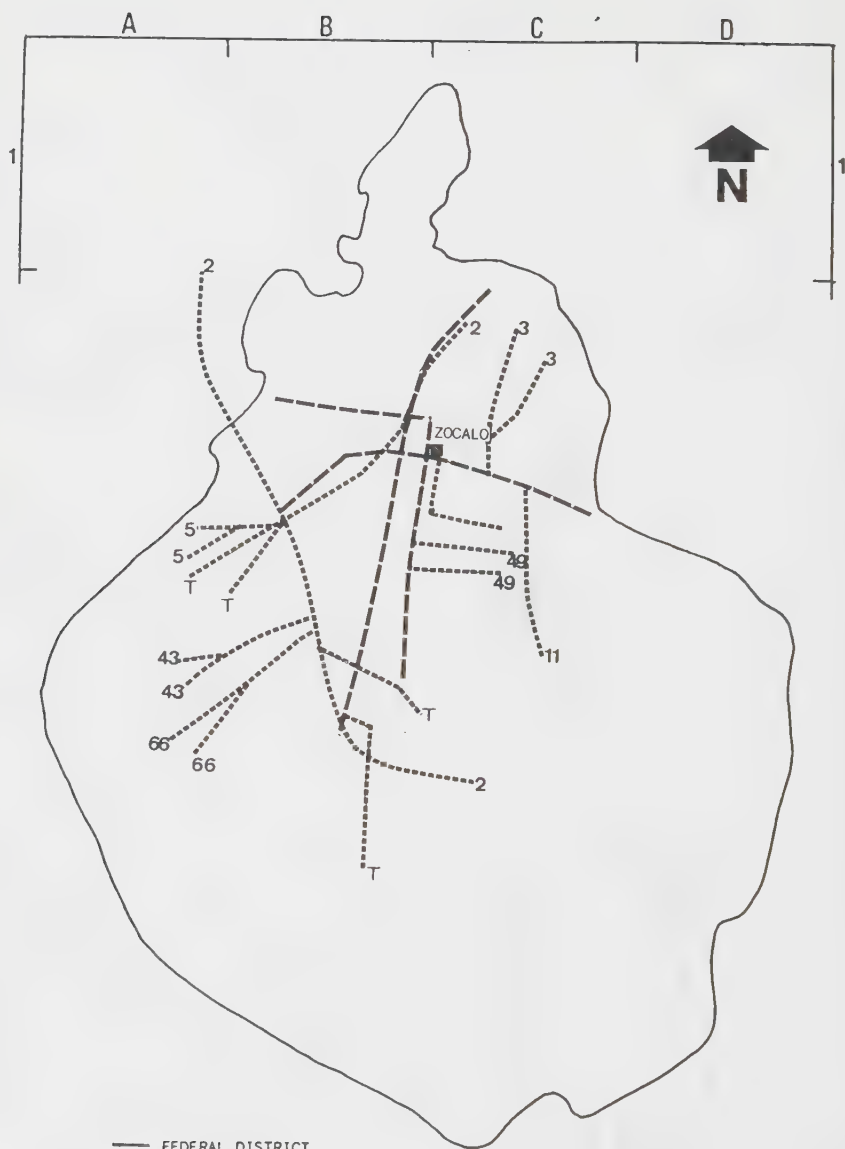
* Reference Maps: inside back cover





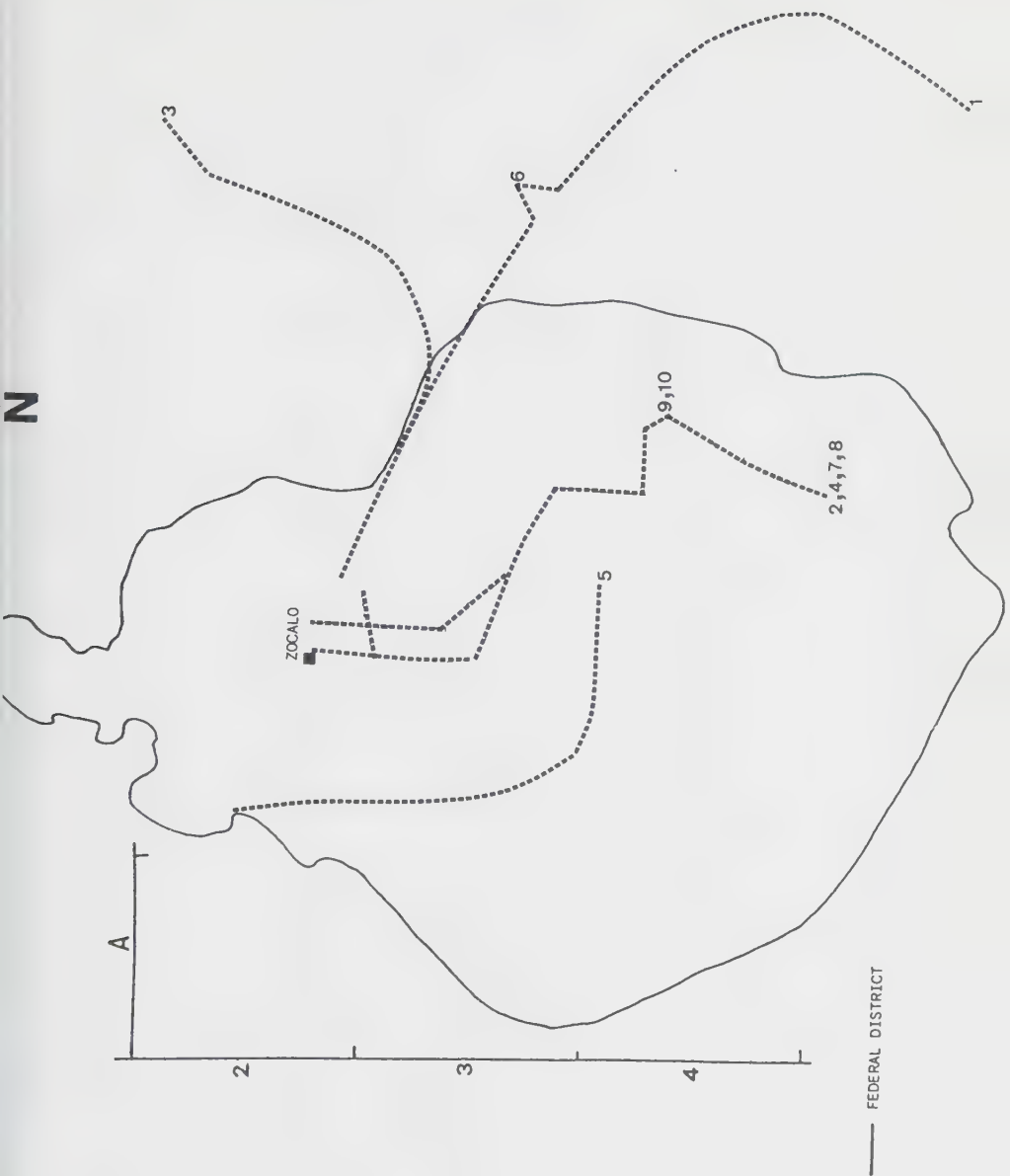






- FEDERAL DISTRICT
- - - METRO LINES
- 2 COLLECTIVE TAXI LINES (REGISTERED)
- T COLLECTIVE TAXI LINES ('TOLERADOS')

N



Appendices

Appendix 1	Twelve Examples of Collective Taxi Routes: Data Collection
Appendix 2	Details of the ISTME Sample Surveys
Appendix 3	The Questionnaires
Appendix 4	Data on the Case-Study Routes
Appendix 5	Official Regulations

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 INTEGRACION DEL SERVICIO DE TAXIS DE RUTA FIJA
 CODIFICACION DE LA RUTA

RUTA No. 1

NOMBRE :

No.	RAMAL NOMBRE	BASE DE SALIDA	BASE TERMINAL	LONGITUD (KMS)	LONGITUD, TIEMPO (HORA VALLE)	HORARIO DE SERVICIO
1	TASQUEÑA VILLA COMPA	Estacion del Metro Paradero Sur.	Calz. Acoxpa esq. con Garita	7.2	10 minutos	6 24
		UNIDADES	CUPO	OPERADORES	TARIFA	TARIFA POR KMS
		50	6	100	10.00	1.38

Appendix 1: Twelve Examples of Collective Taxi Routes: Data Collection

The ISTME study included data collection on all 276 branch lines (ramal) of the collective taxi network. The data sought were as follows:

- In-town terminal (Base de Salida)
- Destination terminal (Base Terminal)
- Route Length (Longitud)
- Journey Time in off-peak hours (Longitud Tiempo Hora valle)
- Hours of Service (Horario de Servicio)
- Number of vehicles (Unidades)
- Seats per vehicles (Cupo)
- Number of Drivers (Operadores)
- Fare (Tarifa)
- Fare per Kilometer (Tarifa por Kms).

Twelve examples of the completed data-sheets, including the three case-study routes, are given in this appendix. The registered routes were numbered 1 to 70 and the "tolerados" were given identifying letters A to O.

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· · · · · RUTA No. 1 · · · · · NOMBRE :

No.	RAMAL NOMBRE	BASE DE SALIDA	BASE TERMINAL	LONGITUD (KMS)	LONGITUD, TIEMPO (HORA VALLE)	HORARIO DE SERVICIO
		UNIDADES	CUPO	OPERADORES	TARIFA	TARIFA POR KMS
20	TOREO CUEMANCO	Avenida Toreo esq. con Anillo Periferico	Anillo Periferico esq. con Canal de Cuemanco	32.4	50 mins.	6 - 24
		500	6 / 10	800	25.00	0.77

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RUTA No. 1

NOMBRE :

Nº. 8	RAMAL NOMBRE C. U. POLITECNICO	BASE DE SALIDA	BASE DE TERMINAL	LONGITUD (KMS)	LONGITUD, TIEMPO (HORA VALLE).	HORARIO DE SERVICIO
		Av. Insurgentes	Av. I. P. N.			
		Circuito Escolar	esq. con	22.2	05 minutos	6am. 8pm.
		Ticomán.				
		UNIDADES	CUPO	OPERADORES	TARIFA	TARIFA POR KMS
		60	6	70	15	0.67

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RUTA No. 2

NOMBRE :

No.	RAMAL NOMBRE	BASE DE SALIDA	BASE TERMINAL	LONGITUD (KMS)	LONGITUD, TIEMPO (HORA VALLE)	HORARIO DE SERVICIO
		Frente a la S. S. A	Plaza Satellite	13.8	20 minutos	24 horas
		UNIDADES	CUPO	OPERADORES	TARIFA	TARIFA POR KMS
		90	6	180	20.00	1.44

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RUTA No. 9

NOMBRE :

No.	RAMAL NOMBRE	BASE DE SALIDA	BASE TERMINAL	LONGITUD (KMS)	LONGITUD, TIEMPO (HORA VALLE.)	HORARIO DE SERVICIO
		UNIDADES	CUPO	OPERADORES	TARIFA	TARIFA POR KMS
3	METRO ZARAGOZA ESPERANZA	200	6	250	14.00	1.19
				11.7	33 minutos	5.00 2.30

Calz. I. Zaragoza
 esq. con Calle 69
 Cama de Piedra
 (no hay base)

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 INTEGRACION DEL SERVICIO DE TAXIS DE RUTA FIJA
 CODIFICACION DE LA RUTA

RUTA No. 17

NOMBRE :

No.	RAMAL NOMBRE	BASE DE SALIDA	BASE TERMINAL	LONGITUD (KMS)	LONGITUD, TIEMPO (HORA VALLE)	HORARIO DE SERVICIO
4	METRO QUITLANHUAC SAN PABLO	Calz. Mexico - Tecuba esq. con Av. Cuitlehuac	Prol. Av. San Pablo Xalpa esq. con Av. Benito Juarez	6.6	30 minutos	6 - 22.00
		UNIDADES	CUPO	OPERADORES	TARIFA	TARIFA POR KMS
		40	6	80	6.00	0.9

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 CODIFICACION DE LA RUTA

RUTA No. 21

NOMBRE :

No. 3	RAMAL NOMBRE MILPA ALTA JAMAICA	BASE DE SALIDA	BASE TERMINAL	LONGITUD (KMS)	LONGITUD, TIEMPO (HORA VALLE)	HORARIO DE SERVICIO
		Jalisco eq. con Guanaajuato	Torno eq. con Eje 3 Sur.	36.0	100 minutos	5 - 23.00
		UNIDADES	CUPO	OPERADORES	TARIFA	TARIFA POR KMS
		40	10	50	25.00	0.69

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 CODIFICACION DE LA RUTA

RUTA No. 32

NOMBRE :

No.	RAMAL NOMBRE	BASE DE SALIDA	BASE TERMINAL	LONGITUD (KMS)	LONGITUD, TIEMPO (HORA VALLE)	HORARIO DE SERVICIO
1	METRO TASQUEÑA STO. DOMINGO	Lado Sur de la estacion	Moctezuma entre Mixtecas y Totot- nacas.	7.2	16 minutos	4.30 - 1.00 am
		UNIDADES	CUPO	OPERADORES	TARIFA	TARIFA POR KMS
		25	6	25	7.00	0.97

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 INTEGRACION DEL SERVICIO DE TAXIS DE RUTA FIJA
 CODIFICACION DE LA RUTA

RUTA No. 61

NOMBRE :

No.	RAMAL NOMBRE	BASE DE SALIDA	BASE TERMINAL	LONGITUD (KMS)	LONGITUD, TIEMPO (HORA VALLE)	HORARIO DE SERVICIO
1	XOCHIMILCO MIXQUIC	Gaudencia de la Llave esq. con Nezahualcoyotl	Zapata esq. con Independencia	20.3	45 minutos	5 - 22.00
		UNIDADES	CUPO	OPERADORES	TARIFA	TARIFA POR KMS
		160	6	160	15.00	0.73

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 INTEGRACION DEL SERVICIO DE TAXIS DE RUTA FIJA
 CODIFICACION DE LA RUTA

RUTA No. 70

NOMBRE :

No.	RAMAL NOMBRE	BASE DE SALIDA	BASE TERMINAL	LONGITUD (KMS)	LONGITUD, TIEMPO (HORA VALLE)	HORARIO DE SERVICIO
1	HUITPULCO SN ANDRES TOTOLTEPEC	Sn Juan Bosco esq. 5 de Febrero esq. con calz. de Ilael con Nicolas Bravo pan		5.7	38 minutos	6 24.00
		UNIDADES	CUPO	OPERADORES	TARIFA	TARIFA POR KMS
		50	6	60	10.00	1.75

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 INTEGRACION DEL SERVICIO DE TAXIS DE RUTA FIJA
 CODIFICACION DE LA RUTA

RUTA No. "A"

NOMBRE : UNION DE TAXISTAS DEL CENTRO DEL D.F.

No.	RAMAL NOMBRE	BASE DE SALIDA	BASE TERMINAL	LONGITUD (KMS)	LONGITUD, TIEMPO (HORA VALLE)	HORARIO DE SERVICIO
		UNIDADES	CUPO	OPERADORES	TARIFA	TARIFA POR KMS
5	METRO NORMAL EJERCITO NACIONAL	Calz. Mexico - tacuba esq. con Av. de los Ma - tros.	Ejercito Nacional esq. con Molinera	4.5	17 minutos	24 horas
		40	6	50	6.00	1.33

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INTEGRACION DEL SERVICIO DE TAXIS DE RUTA FIJA

CODIFICACION DE LA RUTA

RUTA No. "H"

(Ruta 85)

NOMBRE :

Agrupacion SorJuana Inez de la Cruz

No.	RAMAL NOMBRE	BASE DE SALIDA	BASE TERMINAL	LONGITUD (KMS)	LONGITUD, TIEMPO (HORA VALLE)	HORARIO DE SERVICIO
4	METRO CANDELARIA OZUMBA	Sn Ciprien esq. con Corregidora	A. Alzate esq. con Plaza de la Cons- titucion.	66.7	96 minutos	4.00 - 22.00
		UNIDADES	CUPO	OPERADORES	TARIFA	TARIFA POR KMS
		180	10	200	50.00	0.74

Appendix 2: Details of the ISTME Sample Surveys

Results from the ISTME passenger and driver surveys were based on questions asked on a sample of the collective taxi lines. For the passenger survey the 25 most heavily travelled lines were chosen. These were chosen by means of the number of drivers registered to each line and a sample of 8,000 passengers of a daily total of 2,400,000¹⁾ were questioned. For example Route 1 has 13.8% of the total drivers working for the sector, thus 13.8% of the passengers were taken from Route 1. The final result had to be based on 24 lines as one route had been discontinued. The 24 lines were divided as follows:

Route 1:	13.81% of 8,000 =	1,105 passengers
Route 2:	2.93% of 8,000 =	235 passengers
Route 3:	4.57% of 8,000 =	366 passengers
Route 5:	2.64% of 8,000 =	211 passengers
Route 11:	3.30% of 8,000 =	264 passengers
Route 14:	5.68% of 8,000 =	454 passengers
Route 15:	2.01% of 8,000 =	161 passengers
Route 16:	2.64% of 8,000 =	211 passengers
Route 17:	1.76% of 8,000 =	141 passengers
Route 19:	2.02% of 8,000 =	162 passengers
Route 20:	2.62% of 8,000 =	210 passengers
Route 25:	3.82% of 8,000 =	306 passengers
Route 39:	1.58% of 8,000 =	126 passengers
Route 43:	2.47% of 8,000 =	198 passengers
Route 49:	3.52% of 8,000 =	282 passengers
Route 50:	3.52% of 8,000 =	282 passengers
Route 51:	1.80% of 8,000 =	144 passengers
Route 66:	2.20% of 8,000 =	176 passengers
Route A:	2.51% of 8,000 =	201 passengers
Route D:	6.68% of 8,000 =	534 passengers
Route F:	4.80% of 8,000 =	384 passengers
Route K:	18.26% of 8,000 =	1,461 passengers
Route M:	2.64% of 8,000 =	214 passengers
Route O:	2.22% of 8,000 =	178 passengers
<u>24 Routes</u>		<u>8,000 passengers</u>

1) ISTME: 1980, 22.

For the survey of drivers the sample was based on the number of vehicles: an estimated 25,000 including 'tolerados'²⁾. Of these, 800 drivers on the 20 lines with the most vehicles were to be questioned. Again the number of routes used for the sample survey had to be reduced so that the end result covers 19 routes, as follows:

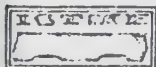
Route 1:	22.1% of 800 drivers =	177 drivers
Route 2:	7.9% of 800 drivers =	63 drivers
Route 3:	5.0% of 800 drivers =	40 drivers
Route 11:	5.4% of 800 drivers =	43 drivers
Route 14:	6.1% of 800 drivers =	49 drivers
Route 15:	2.3% of 800 drivers =	18 drivers
Route 17:	3.4% of 800 drivers =	27 drivers
Route 20:	3.6% of 800 drivers =	29 drivers
Route 25:	4.7% of 800 drivers =	38 drivers
Route 28:	2.2% of 800 drivers =	18 drivers
Route 34:	2.2% of 800 drivers =	18 drivers
Route 49:	6.3% of 800 drivers =	50 drivers
Route 50:	4.2% of 800 drivers =	34 drivers
Route 66:	3.4% of 800 drivers =	27 drivers
Route A:	2.1% of 800 drivers =	17 drivers
Route D:	4.5% of 800 drivers =	36 drivers
Route F:	2.0% of 800 drivers =	16 drivers
Route H:	3.4% of 800 drivers =	27 drivers
Route K:	9.2% of 800 drivers =	<u>74 drivers</u>
<u>19 Routes</u>		<u>800 drivers</u>

The calculations for the size of the samples were done in the ISTME office and not by the author.

2) DEPARTAMENTO DE AUTOTRANSPORTES Y ESTACIOAMIENTO: 1980, 41.

Appendix 3: The Questionnaires

We include in this Appendix the six question sheets used. The first two are the passenger and driver questionnaires for the ISTME study followed by three questionnaires used for the three case-study routes. The last questionnaire was used for government and transport planning authorities in order to answer some questions about the collective taxi sector generally. The translations from Spanish here and throughout the thesis have been done by the author.



FECHA: _____

PROYECTO No _____

HOJA _____

DRIVER QUESTIONNAIRE

CUESTIONARIO PARA OPERADORES DE TAXIS DE RUTA FIJA

HOW MANY HOURS AND ON WHICH DAYS DO YOU WORK AS A DRIVER

¿CUANTAS HORAS Y CUANTOS DIAS TRABAJA COMO OPERADOR

HORAS	L M	M T	M W	J T	V F	S S	D S
2	☐	☐	☐	☐	☐	☐	☐
4	☐	☐	☐	☐	☐	☐	☐
6	☐	☐	☐	☐	☐	☐	☐
8	☐	☐	☐	☐	☐	☐	☐
10	☐	☐	☐	☐	☐	☐	☐
10	☐	☐	☐	☐	☐	☐	☐

ESTADO DEL VEHICULO

STATE OF THE VEHICLE

SU TAXI ES:

BUENO
GOODREGULAR
REGULARMALO
BADPROPIO
OWN VEHICLEALQUILADO
RENTED VEHICLE

CUANTO PAGA DIARIO AL DUEÑO

RENT PAID DAILY

CUANTO GANA DIARIO

AMOUNT TAKEN DAILY

MODELO _____

MARCA _____

VEHICLE'S YEAR OF MAKE

¿ES NATIVO DE LA CIUDAD

☐ SI☐ NO

VEHICLE TYPE _____

EDAD _____

AGE

ARE YOU A NATIVE OF THE CITY

¿CUANTAS HORAS Y CUANTOS DIAS TRABAJA USTED COMO OPERADOR

HORAS	L	M	M	J	V	S	D
2	☐	☐	☐	☐	☐	☐	☐
4	☐	☐	☐	☐	☐	☐	☐
6	☐	☐	☐	☐	☐	☐	☐
8	☐	☐	☐	☐	☐	☐	☐
10	☐	☐	☐	☐	☐	☐	☐
10	☐	☐	☐	☐	☐	☐	☐

ESTADO DEL VEHICULO

SU TAXI ES:

BUENO

REGULAR

MALO

PROPIO

ALQUILADO

CUANTO PAGA DIARIO AL DUEÑO

CUANTO GANA DIARIO

MODELO _____

MARCA _____

¿ES NATIVO DE LA CIUDAD

☐ SI☐ NO

EDAD _____

OBSERVACIONES _____

INVESTIGO _____

SUPERVISO _____



PROYECTO N° _____

FECHA: _____

HOJA _____

ENCUESTA PARA USUARIOS DE TAXIS DE RUTA FIJA
PASSENGER QUESTIONNAIRE

1- DE QUE COLONIA VIENE _____

WHICH SUBURB ARE YOU TRAVELLING FROM

2- A QUE COLONIA VA _____

WHICH SUBURB ARE YOU TRAVELLING TO

3- MOTIVO DE ESTE VIAJE _____

MOTIVE FOR THE JOURNEY

4- CON QUE FRECUENCIA USA ESTE SERVICIO _____

HOW OFTEN DO YOU USE THIS SERVICE

5- CUANTOS MODOS DE TRANSPORTE USA DIARIAMENTE _____

HOW MANY MODES OF TRANSPORT DO YOU USE DAILY

6- QUE OPINA DE ESTE SERVICIO _____

WHAT DO YOU THINK OF THIS SERVICE

7- PRECIO DE ESTE SERVICIO _____

PRICE OF THIS SERVICE

OBSERVACIONES _____

INVESTIGO _____

SUPERVISO _____

1- DE QUE COLONIA VIENE _____

2- A QUE COLONIA VA _____

3- MOTIVO DE ESTE VIAJE _____

4- CON QUE FRECUENCIA USA ESTE SERVICIO _____

5- CUANTOS MODOS DE TRANSPORTE USA DIARIAMENTE _____

6- QUE OPINA DE ESTE SERVICIO _____

7- PRECIO DE ESTE SERVICIO _____

OBSERVACIONES _____

INVESTIGO _____

SUPERVISO _____

CUESTIONARIO DE UECUARIOS

PASSENGER QUESTIONNAIRE

TAXIS DE RUTA FIJA

A:

ROUTA/RAMAL :

ROUTE/ BRANCHLINE

ORIGEN JOURNEY ORIGIN		7. TIE PO EN TRANSPORTACION: TIME SPENT DAILY ON TRANSPORT 1. 0 - 15 3. 30 - 60 2. 15 - 30 4. MAS: MORE	
DESTINO JOURNEY DESTINATION		8. OPI ION DEL SERVICIO: OPINION OF THE SERVICE	
MOTIVO TRAVEL MOTIVE		9. ¿ POR QUE USA TAXI COLECTIVO? WHY DO YOU USE THE COLLECTIVE TAXI	
VIAJE: 1. TRABAJO 5. COMPRAS WORK SHOPPING 2. A CASA 6. VISITA TO GO HOME VISIT 3. ESTUDIO 7. MEDICO STUDY MEDICAL 4. DE PASEO 8. OTRO RECREATION OTHER			
OCCUPACION : 1. OBRERO 4. EMPLEADO OCCUPATION LABOURER OFFICE WORKER 2. ESTUDIANTE 5. HOGAR STUDENT HOUSEWIFE 3. PROFESIONISTA 6. OTRA PROFESSIONAL OTHER		OBSERVACIONES :	
MODOS DE TRANSPORTE USADOS DIARIOS: TRANSPORT MODES USED DAILY 1. METRO 4. TAXI COLECTIVO METRO COLLECTIVE TAXI 2. AUTOBUS 5. A PIE BUS ON FOOT 3. AUTO PARTICULAR 6. OTRO PRIVATE CAR OTHER			
COSTO DIARIO DEL TRANSPORTE: DAILY COST OF TRANSPORT 1. 5 - 10 4. 20 - 25 2. 10 - 15 5. 25 - 30 3. 15 - 20 6. MAS: MORE			

CUESTIONARIO PARA PRESIDENTES

TAXIS DE RUTA FIJA

QUESTIONNAIRE FOR ROUTE PRESIDENTS

FECHA:

DATE

RUTA Y RAMAL

ROUTE AND BRANCHLINE

1. ¿ CUANDO SE ESTABLECIO ESTE RAMAL ?
WHEN WAS THIS ROUTE ESTABLISHED
2. ¿ COMO SE ESTABLECIO Y PORQUE ?
HOW WAS IT ESTABLISHED AND WHY
3. ¿ SU LONGITUD, PRECIO, NUMERO DE UNIDADES, NUMERO DE OPERADORES, Y
WHAT IS ITS LENGTH; FARE; NUMBER OF VEHICLES; NUMBER OF DRIVERS AND
BASES: HAN CAMBIADO ? ¿ CUANDO ? ¿ COMO CAMBIARON ?
TERMINALS: HAVE THESE CHANGED; WHEN AND HOW
4. ¿ USAN COMBIS Y/O CAMIONETAS, O LOS PIENSA USAR EN EL FUTURO ?
DO YOU USE COMBIS OR CAMIONETAS OR ARE YOU THINKING OF USING THEM IN THE FUTURE
5. ¿ APROXIMADAMENTE, CUANTOS USUARIOS TRANSPORTAN AL DIA EN ESTE RAMAL ?
APPROXIMATELY HOW MANY PASSENGERS DO YOU TRANSPORT PER DAY ON THIS BRANCHLINE
6. ¿ CUANTO ES LA CUOTA PARA TRABAJAR EN ESTE RAMAL ?
HOW MUCH IS THE QUOTA TO WORK ON THIS BRANCHLINE
7. ¿ EXISTEN PROBLEMAS LEGALES EN LA ORGANIZACION DE LOS RAMALES ?
ARE THERE LEGAL OR ORGANISATIONAL PROBLEMS FOR THESE BRANCHLINES
8. ¿ COMO VE, O LE GUSTARIA VER EL FUTURO DE A) SU RUTA B) LOS TAXIS
HOW DO YOU SEE; OR WOULD LIKE TO SEE, THE FUTURE FOR YOUR ROUTE AND FOR THE COLLECTIVE TAXIS
COLECTIVOS EN GENERAL ?
IN GENERAL

ENCUESTARIO PARA OBTENEDORES
DRIVERS' QUESTIONNAIRE
TAXIS DE RUTA FIJA

HOPA:

TIME
FECHA:

RUTA Y RAMAL:

ROUTE AND BRANCHLINE

DATE

1. CUANTO TIEMPO TIENE TRABAJANDO

EN ESTE RAMAL? EN OTRO LUGAR?

HOW LONG HAVE YOU BEEN WORKING ON THIS BRANCHLINE

HAVE YOU WORKED AS A DRIVER ELSEWHERE

2. ES PROPIETARIO DEL CARRO

O LO RENTA

DO YOU OWN THE CAR OR RENT IT

SI LO RENTA: CUANTO ES LA

CUENTA AL PROPIETARIO:

IF RENTED - HOW MUCH IS THE QUOTA TO THE OWNER

3. DE QUE MARCA:

Y MODELO:

ES EL CARRO?

WHAT TYPE AND YEAR IS THE VEHICLE

4. CUANTO ES LA CUOTA A LA RUTA:

HOW MUCH IS THE QUOTA TO THE ROUTE ORGANISORS

5. QUE ES SU HORARIO:

WHAT HOURS DO YOU WORK

6. CUALES DIAS DE LA SEMANA TRABAJA:

WHICH DAYS OF THE WEEK DO YOU WORK

L M M J V S D

M T W T F S S

7. SU EDAD ES :

HOW OLD ARE YOU

OBSERVACIONES:

COLOUR OF PLATE: R V

COLOUR OF THE NUMBER PLATE RED / GREEN

Questionario acerca de la política del
Gobierno en relación con los taxis colectivos

GOVERNMENT AUTHORITIES QUESTIONNAIRE

1. ¿Cuáles son las mayores a) ventajas b) desventajas del servicio
WHAT ARE THE MAJOR ADVANTAGES AND DISADVANTAGES OF THE COLLECTIVE TAXI SERVICE
de taxis colectivos?
2. ¿Qué es la política del gobierno en relación con los taxis colectivos
WHAT IS GOVERNMENT POLICY IN RELATION TO THE COLLECTIVE TAXIS
a) en este sexenio?
IN THIS GOVERNMENTAL TERM
b) en el próximo?
IN THE FOLLOWING YEARS
3. ¿Cuáles problemas ve Usted en la organización de los taxis
WHAT PROBLEMS DO YOU SEE IN THE ORGANISATION OF COLLECTIVE TAXIS
colectivos a) ahora?
NOW
b) en el futuro?
IN THE FUTURE
4. ¿Será posible y/o ventajosa la municipalización de los taxis
WOULD THE MUNICIPALISATION OF THE COLLECTIVE TAXIS BE POSSIBLE AND/OR BENEFICIAL
colectivos?
5. ¿Cómo ve Ud. el futuro de los taxis colectivos? Como le gustaría
HOW DO YOU SEE THE FUTURE FOR THE COLLECTIVE TAXIS HOW WOULD YOU LIKE
ver este futuro para los taxis colectivos?
TO SEE THE FUTURE FOR THE COLLECTIVE TAXIS

Appendix 4: Data on the Case-Study Routes

Apart from the basic characteristics collated in Table 2, and the geographical profile of the routes shown on Map 7, some interesting data were gathered through interviewing the route presidents. We would like to describe each route in turn, beginning with a resumé of the facts discussed in the foregoing chapters and following with details of the development of the line.

● Route 1.20

From the text, line 1.20 is revealed as a newly developing intra-urban route. The number of drivers and vehicles shows it to be an important branchline, used for the work-trip by a relatively large number of professionals and office workers. The fare is high in comparison with the bus route which serves exactly the same motorway, thus the collective taxi's successful service depends upon speed and frequency. The route operates with a large number of private vehicles, evidence of illegal and continual rapid growth, and the prolongation of the line in March 1980 shows its adaptation to public demand. Sixty percent of its passengers are satisfied with the service and the increasing number of new Combis used points to continued growth in the future. For example, an owners assembly in November 1981 voted to extend the service to four times its present length outside of the Federal District, for recreation trips on Sundays: the owners were willing to pay 10,000 pesos each for a permit to travel into the neighbouring States of Mexico and Morelia.

The route itself is run as a co-operative, after beginning as a 'tolerado' line with six vehicles in September 1979. The original fare was 10 pesos, raised to 15 when the route was extended. The present route president worked previously with a tolerado route in the State of Mexico and secured the registration of the 1.20 route in late 1980. The main legal

problem now is a continuing battle with the local police, paying fines because of the lack of official number plates. As with collective taxis in general, however, the 1.20 route is tolerated because it is necessary. The route moves (1981) approximately 8,000 people per day with headways of 1.25 minutes.

● Route 9.3

This is an older, less dynamic route, used by labourers of the low income settlement of Netzahualcoyōtl, in the State of Mexico. The route is therefore used to travel to and from workplaces in the Federal District. It is, with 120 vehicles, much smaller than Route 1.20, but the predominantly saloon vehicles are almost always full. The route is based at a Metro station and therefore works as a feeder line to the mass transit network of the capital. Journeys are concentrated into a few hours in the morning and evening and drivers take a break of up to four hours in the middle of the day. As Route 9.3 has been registered since 1969, the majority of vehicles carry an official number plate. The distance from Zaragoza to Netzahualcoyōtl is also covered by first and second class bus lines, but these buses are old and very full: the collective taxi fare is therefore paid for reasons of comfort and speed. Only 30% of passengers however are satisfied with the service, due to a lack of organisation at street level and the relatively old vehicles.

When the route originated, as a tolerado line in 1963, there were no other means of transport from Netzahualcoyōtl to the capital. The original fare was 5 pesos and the route began with 12 vehicles. The length of the route depends to a certain extent on its passengers; after 11 p.m. when there are no buses, the vehicles travel further into the State of Mexico for an increased fare. The route now moves approximately 3,000 passengers per day (1981) and headways are an average 5.5 minutes.

- Route 85

The Route 85 case-study is a rural to urban tolurado line. Its offices are in the State of Mexico and the majority of drivers are from outside the Federal District. This line is also much smaller than Route 1.20, moving approximately 4,000 passengers per day (1981). The route is well organised, with weekly meetings of owners, and with each driver assigned a time of day when he must be available. Drivers are also assigned a Wednesday or Thursday rest day, because there is more rather than less traffic on Saturdays and Sundays. The hours of service have been extended to cope with evening traffic: many drivers work 5 o'clock to 8 o'clock in the morning and again from 5 to 8 in the evening. The vehicles used are almost all new Combis working under temporary permit. The Combis are important since many passengers carry farm produce to and from the Merced market, though the vehicles themselves are not suited to rural roads. The route serves as a link for the agricultural producing areas of the eastern State of Mexico to the capital and is therefore used less as a daily mode of transport. Only 35% of the passengers use the line daily.

The distance is also covered by long distance coaches; these are only 30% cheaper than the collective taxi line, can only be taken from the coach terminal and have a reputation for dangerous driving, thus the reasons of comfort and safety are important for the Route 85 passengers. As with Route 1.20, the majority of passengers are pleased with the service.

The route was only a year old when it was being investigated (September 1981). It took four years to establish since it is an unusual route: it has permission to carry passengers from the State of Mexico into the Federal District. Route 9.3, though also travelling from the State of Mexico to the Federal District, has no such permit: drivers are fined 2,000 pesos if caught bringing passengers into the capital.

Route 85 began with 20 vehicles, charging 40 pesos for the complete trip. The in-town terminal of Candelaria was chosen specifically due to its nearness to the Merced market. Headways are an average of 4.5 minutes, varying, however, from one car every two minutes in the morning to one every ten minutes at midday.

Appendix 5: Official Regulations

The following memorandum was issued by the Department of Transport and Parking (Departamento de Autotransporte y Estacionamiento) as a framework for the collective taxi sector, in July 1981.



DEPARTAMENTO
DEL
DISTRITO FEDERAL

DEPENDENCIA	DIRECCIÓN GENERAL DE POLICÍA Y TRÁNSITO D.F.
SECCIÓN	
MESA	
NUMERO DE OFICIO	
EXPEDIENTE	

ASUNTO: C I R C U L A R No. 24774

México D.F., 24 de Julio de 1981.

C.C.

Para el efecto de señalar cual es el sentido que da esta Dirección General a mi cargo, a los artículos 103 al 193 del Reglamento de Tránsito del Distrito Federal y al 36 del Reglamento para el Servicio Público de Transporte de Pasajeros en el Distrito Federal, me permito emitir la siguiente circular.

I.- D E F I N I C I O N E S

1.- SITIO

Es la agrupación de concesionarios debidamente autorizados por el Departamento del Distrito Federal para prestar el servicio de transporte público de pasajeros en automóviles de alquiler, ante quien el público puede acudir para solicitar el servicio.

2.- RUTA

Es la agrupación de concesionarios debidamente autorizados por el Departamento del Distrito Federal, para prestar el servicio colectivo de transportación pública de pasajeros en automóviles de alquiler con itinerario fijo.

3.- BASE

Es el lugar de la vía pública autorizado por la Dirección General de Policía y Tránsito, para que los vehículos pertenecientes a un Sitio o una Ruta se estacionen con el objeto de que el público acuda a solicitar el servicio.

4.- PERMISIONARIO

Es la persona propietaria de un vehículo autorizado por el Departamento del Distrito Federal para prestar el servicio de transporte público de pasajeros en automóviles de alquiler, con o sin itinerario fijo.



DEPENDENCIA
.....
SECCION
MESA
NUMERO DE OFICIO
EXPEDIENTE

DEPARTAMENTO
DEL
DISTRITO FEDERAL

ASUNTO:

II.- DE LA ORGANIZACION

1.- Todo Sitio o Ruta estará constituido por permisionarios, debiendo ser uno de estos su representante legal quien será elegido en asamblea por la mayoría de los integrantes de la Organización (50% + 1); quien resulte electo deberá comunicar tal determinación por escrito a la Dirección General de Policía y Transito, dentro de los quince días posteriores a la fecha de designación, anexando copia del acta constitutiva y reglamento interior de trabajo.

2.- El representante de un Sitio o una Ruta, podrá nombrar -- gestores a quienes acreditará debidamente ante la Dirección General de Policía y Transito.

3.- En cada base habrá un despachador que organizará el servicio en cuanto a funcionamiento, atención al usuario, limpieza del lugar, etc.

4.- En el caso de las Rutas es obligatorio:

a).- Prestar servicio invariablemente las 6:00 A.M. a las 22:00 horas los días hábiles, salvo en aquellos casos en los que la Dirección General de Policía y Transito señale como obligatorio el servicio durante las 24 horas.

b).- Observar frecuencias de salida en las bases de 2 minutos como máximo.

c).- Utilizar en cada base únicamente los lugares autorizados a estacionamiento momentáneo, que en ningún caso serán mas de 5 vehículos.

d).- Prestar el servicio con el número de unidades autorizadas por la Dirección General de Policía y Transito del Distrito Federal, para tal efecto.

5.- Cada base de Sitio autorizado por la Dirección General de Policía y Transito, deberá contar con caseta en la que aparecerá con claridad la denominación y el número del mismo, alumbrado eléctrico, teléfono, reloj marcador, sello fechador, bitácora de servicio y control de datos, en donde se anotan diariamente las placas a que pertenecen los vehículos autorizados para concurrir a las Bases así como su destino y hora -



- 3 -

DEPARTAMENTO
DEL
DISTRITO FEDERAL

DEPENDENCIA
SECCION
MESA
NUMERO DE OFICIO
EXPEDIENTE

ASUNTO:

de salida. Por cuanto a las Rutas deberá señalarse en las casetas tanto de origen como de destino la denominación y el número de la misma, debiéndose contar con un cobertizo para protección del usuario.

Tanto en las casetas de Sitio como de Ruta, se señalará con claridad y a la vista del público el horario de servicio y tarifas, tarjeta de identificación del despachador y número telefónico de la Dependencia oficial receptora de quejas por deficiencias en el servicio y los itinerarios por cuanto a las Rutas.

6.- Para la instalación de casetas y cobertizos, deberá solicitarse el permiso en la Delegación del Departamento del Distrito Federal, que corresponda.

7.- Ningún empleado del Departamento del Distrito Federal, podrá ser representante, despachador o gestor de Sitio o Ruta.

8.- Solamente con la autorización de la Dirección General de Policía y Tránsito, podrá aumentarse o disminuirse el número de vehículos para un Sitio o una Ruta.

9.- Los Sitios o Rutas autorizadas podrán celebrar convenio de intercambio de servicio, previa aprobación de la Dirección General de Policía y Tránsito.

III.- DE LAS OBLIGACIONES DEL PERSONAL
DEL SITIO O RUTA

1.- EL REPRESENTANTE

Es el responsable del buen funcionamiento de la organización, así como de la falta de cumplimiento al Reglamento de Tránsito y disposiciones conexas, que cometen sus empleados y tendrá las siguientes obligaciones:

a).- Tramitar por sí mismo o por conducto de sus gestores, los asuntos relacionados con su organización, ante la Dirección General de Policía y Tránsito, siempre que por disposiciones legales no este especificado que tales trámites deben hacerlos personalmente los permisionarios.

Al constar este oficio, cense los datos
cometidos en el cuadro del ángulo superior
derecho.



DEPARTAMENTO
DEL
TRITO FEDERAL

ASUNTO:

DEPENDENCIA
SECCION.....
MESA.....
NUMERO DE OFICIO.....
EXPEDIENTE

- 
- b) Mantener en buenas condiciones de operación, funcionamiento, comodidad e higiene las bases.
 - c) En el caso de los Sitios expedir decenal o semenalmente - tarjetas de control de salida de los vehículos.
 - d) Por cuanto a las Rutas registrar un control semanal de los vehículos que deban ser alternados en las Delegaciones autorizadas.
 - e) Hacer las anotaciones correspondientes en la libreta folgada de control de Ruta o Sitio, autorizada por la Dirección General de Policía y Tránsito.
 - f) Presentarse cuando la Dirección General de Policía y Tránsito lo requiera.
 - g) Llevar un control del personal perteneciente al Sitio ó a la Ruta y tener un archivo con las características de los --- automóviles, nombre y dirección actualizado del permisionario y responsable, así como de los choferes con su número de licencia y los movimientos de altas y bajas.
 - h) Expedir y recoger semanalmente las tarjetas de control de salida y llegada y remitir mensualmente a la Dirección General de Policía y Tránsito, dentro de los 10 primeros --- días de cada mes, un informe en el que se manifiesten que los vehículos prestaron servicio y cuales no cumplieron con las disposiciones que dictan las autoridades correspondientes, mismas que deberán hacer del conocimiento tanto de los permisionarios como de los choferes.
- Dar aviso a la Dirección General de Policía y Tránsito de las irregularidades que observe en el servicio, vigilar --- que se cumplan con las disposiciones reglamentarias en la especie y avisar a los permisionarios de las infracciones --- que se levanten a sus choferes.

2.- EL DESPACHADOR

Es responsable del funcionamiento de la Base y tendrá las siguientes obligaciones:

- a) Atender al público usuario que solicite los servicios de --- transportación, indicándole con toda cortesía el vehículo --- que deba abordar.
- b) Asignar la salida de los vehículos en riguroso orden de llegada y respecto a las Rutas fijas como de salida frecuencia máxima de salida 2 minutos, independientemente del volumen de pasaje.
- c) En el caso del Sitio, marcar con el reloj correspondiente las tarjetas de registro de cada vehículo, la hora de salida de destino. Cuando falle la luz o el reloj, el despachador podrá marcar con un sello fechador tales datos.
- d) Informar al representante de la Ruta las alteraciones a reportadas de que tenga conocimiento.



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DEPENDENCIA
SECCION
MESA
NUMERO DE OFICIO
EXPEDIENTE

DEPARTAMENTO
DEL
DISTRITO FEDERAL

ASUNTO:

- e) Vigilar que se cumpla el Artículo 191 del Reglamento de - Transito del Distrito Federal.
- f) Impedir la prestacion del servicio a los operadores que - se encuentren bajo el estado de ebriedad o el efecto de - estupefacientes, así como de los vehículos que estan en - malas condiciones, reportando el caso al representante de la Ruta o Sitio.

3.- LOS CONDUCTORES

Los conductores de los vehículos son los responsables del -- buen funcionamiento del servicio y tienen las siguientes --- obligaciones:

- a) Presentarse a la base para iniciar el servicio, en condi- ciones adecuadas de aso, tanto en su persona como su --- vehículo.
- b) Tener al corriente los documentos que les autoricen a ma- nejar, así como los requisitos legalmente para la circu- lacion del servicio.
- c) Portar en lugar visible para los usuarios su tarjetón de- identificación.
- d) En el caso de las Rutas ejecutar el recorrido sin altera- ciones, que deberán estar apegadas a lo especificado en- los oficios de concesion autorizados por el Departamento-- del Distrito Federal.
- e) Respetar las tarifas establecidas legalmente.
- f) No coleccionar pasaje, salvo que se trate de personas en- estado inconveniente y con notorio estado de desaseo.
- g) Durante las horas de trabajo los conductores deberan uti- lizar el uniforme que para el caso establezcan la Direc- cion General de Policía y Transito.
- h) Los conductores de vehículos en un sitio observarán ade- mas lo siguiente:
 - 1.- Hacer un mínimo de 5 salidas por tiempo de servicio.
 - 2.- No circular con bandera baja, salvo cuando viaje a cubrir un servicio solicitado a domicilio, cuando se encuentre - a 500 metros de su base o cuando circule dentro de un tien- po maximo de 90 minutos, despues de la ultima salida de su Sitio.
 - 3.- No negar el servicio, excepto cuando esté dentro de su -- tiempo maximo de 90 minutos, a que se habla en el parrafo anterior.
 - 4.- No empalmar pasaje, es decir, cuando lleve pasaje no po- dra subir a otro, salvo cuando salga de la base y previo consentimiento del pasaje en turno.
 - 5.- No podrá llegar a su base a checar el tarjetón con pasaje a bordo.

Al contestar este oficio, tiene los datos contenidos en el cuadro del ángulo superior derecho.



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DEPARTAMENTO
DEL
DISTRITO FEDERAL

DEPENDENCIA
SECCION
MESA
NUMERO DE OFICIO
EXPEDIENTE

ASUNTO:

6.- Si en un término de 5 minutos después de arribar a su base no son solicitudes sus servicios podrá salir de ella, siempre y cuando se encuentren los vehículos -- necesarios para atender al público usuario, debiendo registrar sus salidas con la bandera libre.

4.- LOS PERMISIONARIOS

Serán responsables de que las personas a que se les encomienda el manejo de un vehículo del servicio público de -- transporte de pasajeros en automóviles de alquiler, tenga conocimiento de las disposiciones de la Dirección General de Policía y Tránsito y que estén en orden los documentos -- que lo autorizan a manejar y tendrá además las siguientes obligaciones:

- Mantener su vehículo en buenas condiciones de presentación, higiene y funcionamiento.
- Hacer del conocimiento de la Dirección General de Policía y Tránsito, el nombre, domicilio y número de licencia de los choferes que manejen el vehículo.
- Dar aviso al Sitio o a la Ruta cuando el vehículo no esté en condiciones de servicio; indicando el motivo y el tiempo que estará fuera del mismo, así como el lugar donde se encuentre.
- Presentarse ante la Dirección General de Policía y -- Tránsito, cuando sea requerido.

IV.- DISPOSICIONES GENERALES

Los permisionarios podrán hacer los trámites relacionados con el servicio que prestan, a través de sus representantes o en forma directa ante la oficina que corresponda.

Para los efectos de cambio, altas, bajas y substituciones, deberán observarse las siguientes disposiciones:

- Que las solicitudes sean formuladas por los permisionarios o representantes legales, manifestando estar -- enterados de que estos trámites son gratuitos.
- Que no sea modificado el número de vehículos destinados al servicio, sin previa autorización de la Dirección General de Policía y Tránsito.
- Los vehículos que tengan razón social de radiotelefonía, deberán usar el aparato adecuadamente y sujetarse a las tarifas establecidas para el servicio de Sitio.

A) CAMBIOS

Los movimientos de cambios, sólo se autorizan a Taxis que -- tengan permiso de Sitio o Ruta respectivamente, con el objeto de no disminuir el número de automóviles de transporte -- de servicio público sin itinerario fijo.

Al circular este oficio, círese la copia correspondiente en el cuadro del ángulo superior derecho.



DEPENDENCIA
SECCION
MESA
NUMERO DE OFICIO
EXPEDIENTE

DEPARTAMENTO
DEL
DISTRITO FEDERAL

ASUNTO:

- a) Solamente se podrán efectuar cambios cuando se justifique que existe una vacante por el mismo motivo.
- b) Para poder efectuar el cambio que se solicita deberá adjuntarse la última tarjeta de servicio o la baja del representante de Sitio o Ruta para justificar que ha cumplido en una forma regular con el servicio al que está autorizado.
- c) Solo se podrá efectuar en el transcurso de 12 meses un sólo cambio, ya sea de Sitio a Sitio o de Ruta a Ruta, para poder tener un mejor control.

B) Bajas

Se autorizan las bajas de los Taxis de los Sitios y de las Rutas solicitadas por el representante respectivo, siempre y cuando compruebe que dichos taxis no cumplen eficazmente con el servicio de acuerdo con los Reglamentos y disposiciones giradas por la Dirección General de Policía y Tránsito. Una vez que el representante de Sitio o Ruta aporte a la Dirección General de Policía y Tránsito los elementos de prueba para acreditar las causas o actos a que se radicare el padrón anterior, la autoridad deberá en un plazo preventivo notificar al parasigatario o conductor que es dado de baja y deberá pintar el vehículo en los colores asignados a los del servicio público de transporte de pasajeros sin itinerario fijo.

Por ningún motivo a los automóviles que han sido dados de baja por no cumplir con los Reglamentos y disposiciones giradas por la Dirección General de Policía y Tránsito, se podrá efectuar su alta en otro Sitio o Ruta, hasta después de 12 meses en que fueron sancionados.

C).- Altas

Se autorizan altas en los Sitios y Rutas de vehículos sin itinerario fijo que reúnan los siguientes requisitos:

- a).- Que los vehículos sean de modelo 6 años anteriores al de la fecha de la solicitud respectiva, como mínimo.
- b).- En la solicitud de petición que efectúa el representante, adjuntará la hoja de revista del año anterior.
- c).- Solamente se podrán efectuar estos trámites cuando se justifique que existen vacantes en los Sitios o en las Rutas, o cuando por motivo de servicio sea necesario, previo estudio de la autoridad.

Se autoriza la sustitución de vehículos de alquiler cuando -



DEPARTAMENTO
DEL
TRANSPORTE FEDERAL

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DEPENDENCIA	_____
SECCION	_____
MESA	_____
NUMERO DE OFICIO	_____
EXPEDIENTE	_____

ASUNTO:

estos sean de modelo de 8 años como máximo, anteriores a la fecha de la solicitud, tratándose de 6 u 8 cilindros y 5 - años como máximo si se trata de unidades de 4 cilindros.

Las disposiciones de la presente circular sólo podrán ser corregidas, reformadas o anuladas por la Dirección General de Policía y Tránsito, previo acuerdo del C. Jefe del Departamento del Distrito Federal.

V.- SANCIONES

La infracción a lo dispuesto en este Acuerdo, se sancionará en términos de las disposiciones del Reglamento de Tránsito del Distrito Federal, del Reglamento para Servicio Público de Transporte de Pasajeros en el Distrito Federal y demás disposiciones aplicables en la especie.

Para su debida observancia y cumplimiento, a partir de ésta fecha.

A t e n t a m e n t e
SUFRAGIO EFECTIVO. NO REELECCION
EL DIRECTOR GENERAL DE POLICIA Y
TRANSITO.

GRAL. DE DIV. ARTURO DUNAY MORENO.

Curriculum Vitae

Name	Ulrich geb. Sutherland
Vorname	Linda
Heimatort	Unterstammheim/Zürich
geboren	am 5. Mai 1951 in London
September 1962 bis Dezember 1969	Putney Gymnasium, London, S.W. 15, England; Zwischenprüfungen: Latein, Französisch, Geschichte, Zeichnen, Englisch, Biologie, Geographie, Mathematik (sog. O. Levels); Matura: Englisch, Geschichte, Geographie (sog. A. Levels)
September 1970 bis Juni 1973	Abschlussdiplom in Geographie an der Universität Oxford, Oxford, England
September 1976 bis Dezember 1978	Master of Philosophy Fakultät für Geographie University College Universität London, England Titel der Dissertation: "Verkehrsplanung in Mexico City"
Dissertations-Leitung	Prof. Dr. A. Leemann PD Dr. K. Graf

CURRICULUM VITAE : LINDA ULRICH

- September 1980 - : Ph.d
Institute of Geography
University of Zurich.
Thesis title: Informal
paratransit in Mexico City.
- August 1979 - July 1980 : Spanish Teacher
Institut auf dem Rosenberg
St Gallen, Switzerland
- August 1976 - December 1978 : M.Phil
Department of Geography,
University College, London
Thesis title: Transport
planning in Mexico City
- January 1975 - June 1976 : Lecturer
Department of Economics,
University of the State
Toluca, Mexico
Courses: Resources in Mexico,
Latin American Common Market,
Economic Geography
Urban Planning (Masters)
- March 1974 - June 1976 : Research Assistant
Institute of Urban Development,
Toluca, Mexico
- October 1973 - March 1974 : Geography Teacher
Ernest Bevin School,
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September 1973 : Awarded British Council
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September 1970 - June 1973 : BA Geography
University of Oxford

December 1969 - June 1970 : Private Teacher
Gabbittas-Thring Ltd.,
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August 1962 - December 1969 : Putney High School
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O Levels: English, Art,
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Mathematics, Biology,
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A Levels: English, History,
Geography

S Level: Geography

Languages : Fluent in Spanish, good knowledge of German

Publications : 'The role of the geographer in Mexico'
Boletín IDUR, Vol.1, pp11 - 16, Dec.1974

'El transporte público en Toluca'
Boletín IDUR, Vol.111, pp14 - 21, June 1976

'Collective transport: some alternatives'
Entourno Vol. 1, pp18 - 24, January 1983

Zusammenfassung

Diese Studie untersucht das Sammeltaxi in Mexiko City. Das beschriebene Transportmittel ist ein Beispiel für den Paratransit. Darunter versteht man den Gebrauch von Fahrzeugen, die ohne festen Fahrplan eine kleine Gruppe von Fahrgästen auf dem Strassen-netz der Stadt transportieren. Die beschriebene Art des Paratransit ist ein informeller Beitrag zum Netz der öffentlichen Transportmittel in Mexiko City und bildet eine Brücke zwischen diesem und dem Gebrauch von Privatwagen. Das traditionelle Transportsystem von Mexiko City basiert auf dem Bus, der Strassenbahn und der Untergrundbahn, hinzukommen noch zwei Millionen Privatwagen. Ungefähr zehn Prozent der 18,4 Millionen täglichen Fahrten werden mit dem Sammeltaxi gemacht.

Der Sektor, den wir untersuchen, datiert aus der Zeit um 1950, einer Zeit mit zunehmender Nachfrage und Beförderung. Zu dieser Zeit zogen immer mehr Leute vom Land in die Stadt, und die Hauptstadt breitete sich immer mehr aus. Das Einsetzen von mehr Bussen führte zu Verkehrsstockungen auf den Strassen, und vermehrter Strassenbau hatte eine grössere Anzahl von Privatwagen zur Folge. Diese Situation ist verantwortlich für den informellen Gebrauch von Taxis oder Privatwagen zur Beförderung von mehr als einem Fahrgast.

Das System entwickelte sich langsam: 1970 gab es nur 4'000 Fahrzeuge. Im Laufe der siebziger Jahre nahm die Nachfrage nach diesem Beförderungsmittel jedoch beträchtlich zu, so dass es bis 1980 25'000 Kollektivtaxis gab. Dieser enorme Anstieg gab den Anstoss für die Fragen und Hypothesen dieser Studie.

In dieser Arbeit werden drei Hypothesen aufgestellt:

- Das Kollektivtaxi ist ein Phänomen der Dritten Welt.
- Das Sammeltaxi entwickelt sich als Resultat einer zunehmenden städtischen Nachfrage.
- Das Sammeltaxi ist eine immer verbesserte besondere Dienstleistung, so dass die neueren Sammeltaxigruppen die befriedigendsten sind.

Diesen Hypothesen werden von Februar bis Dezember 1981 in Mexiko City an Ort und Stelle überprüft. Die Daten wurden in zwei Etappen zusammengetragen: Zuerst einmal gab es eine allgemeine Studie über die Merkmale von Sammeltaxis, die mit der Hilfe eines privaten Transportunternehmens (ISTME) gemacht wurde. Als diese grundlegende Arbeit beendet war, konnten drei unterschiedliche Kollektivtaxigesellschaften für Fallstudien verwendet werden.

Die drei Gesellschaften wurden mit Hilfe von ungefähr 1'500 Befragungen untersucht, die mit dem "Präsidenten" der Gruppen, den Fahrern und den Fahrgästen gemacht wurden.

Am Anfang der Studie haben wir untersucht, ob es diese Art von Transportmittel in anderen Städten gibt und welche Sekundärliteratur vorhanden ist. Die ersten Sammeltaxis waren Jitneys, die es in der kurzen Zeit von 1914 bis 1917 in den ganzen USA gab. Reglemente, die erlassen wurden, um das Anwachsen dieser Art von Sammeltaxis zu kontrollieren und die bestehenden Strassenbahngesellschaften zu schützen, bewirkten, dass politisch schwache Jitneygruppen innerhalb von zwei Jahren verschwanden. In den USA gibt es jetzt sehr wenige Beispiele für entwickelte Paratransitsysteme. Es gibt eine Anzahl von "Dial-a-Ride"-Netzen, die sich ausserhalb der Stadtzentren befinden. Auch werden staatliche Programme ausgearbeitet, um das "Car-pooling" zu fördern.

Auch in Grossbritannien gibt es nur wenige Beispiele für Paratransit, die aber nicht ins Gewicht fallen.

In der Dritten Welt jedoch haben die grossen Städte gut eingeführte informelle Paratransitsysteme. Wir haben zuerst nach Asien geschaut, wo der Paratransitsektor eine Vielzahl von Fahrzeugen einschliesst, unter anderem auch nichtmotorisierte Transportmittel wie Hand- und Fahrradrikishas, PKWs und Minibusse. Die Mehrzahl dieser Formen haben sich auf illegale Weise entwickelt. Diese Transportmittel werden von einem grossen Teil der Bevölkerung benutzt. In Kalkutta beträgt der Anteil aller Fahrten mit Motorfahrzeugen 58 Prozent und in Manila 69 Prozent.

Manila hat eine der ersten schriftlich festgehaltenen Arten des Paratransit und eines der bedeutendsten Systeme. Die Grundlage dafür ist der Jeep, der solange benützt werden sollte, bis die Kriegsschäden ausgebessert waren. Ursprünglich wurden die Jeeps benutzt, die die US-Armee nach dem Zweiten Weltkrieg zurückgelassen hatte. Die Fahrzeuge, eine Kreuzung zwischen Jeeps und Jitneys, wurden als Jeepneys bekannt. 1980 waren 17'000 davon in Betrieb. Die Wagen sind grundsätzlich in Privatbesitz und werden an Fahrer vermietet. Sie fahren als Sammeltaxi auf einer bestimmten Strecke, aber Strecke und Einsatz sind flexibel. Somit können auch Verkehrshindernisse und eine grössere Nachfrage berücksichtigt werden. Wie die Studie zeigt, ist diese Flexibilität einer der grössten Vorteile der Sammeltaxis gegenüber den öffentlichen Verkehrsmitteln, die nach einem genauen Fahrplan fahren.

In Süd-Ostasien können wir weitere Beispiele für informellen Transport finden. In indonesischen Städten gibt es eine Reihe von nichtmotorisierten Sammelfahrzeugen, aber der Paratransitbereich besteht hauptsächlich aus den drei- und vierrädrigen "Bemos" und "Opelets". Handrikishas sind auch heute noch in Indiens Städten in Gebrauch und befördern täglich mindestens 30 Prozent der Fahrgäste. In Kalkutta, der einzigen Stadt dieser Grösse ohne Untergrundbahn, benützt die Mehrzahl aller Fahrgäste informelle Verkehrsmittel.

Auch im Mittelmeerraum, in Afrika und in Lateinamerika, haben wir Beispiele für den Paratransit gefunden. In den zwei Mittelmeerstädten Istanbul und Beirut sind Sammeltaxis, für die hauptsächlich grosse amerikanische Wagen verwendet werden, ein wichtiger Bestandteil des öffentlichen Transportsystems. In Nordafrika werden Lastwagen im Paratransitsektor hauptsächlich auf den Landstrassen gebraucht und nicht im Stadtgebiet selbst. Es gibt nur wenig Literatur über den informellen Sektor in Afrika.

Die Beispiele aus Lateinamerika sind besonders interessant, da die Städte, die ein Paratransitsystem haben, sehr ähnlich sind

und in der gleichen geographischen Zone liegen wie unsere Fallstudie. Trinidad, Lima, Caracas und Buenos Aires profitieren von ähnlichen Sammeltaxis wie Mexiko City, und Lima wie auch Kingston verfügen über ein Minibus-System.

Wir kommen zu der Schlussfolgerung, dass sich der Paratransit bis jetzt nur in den Städten der Dritten Welt entwickelt hat.

Die Merkmale des entwickelten Paratransitsystems sind folgende:

- flexibler Fahrplan auf einer grundsätzlich festgelegten Strecke
- vorwiegend private Besitzer
- eine grosse Anzahl von Fahrzeugen
- höhere Fahrpreise und schnellere Beförderung als bei den traditionellen Bussen
- mehr Komfort als bei traditionellen Verkehrsmitteln
- wichtige Rolle bei der Arbeitsbeschaffung.

Die Nachteile dieses Systems sind die unvorsichtige Fahrweise, die man in den meisten der erwähnten Städte findet, und die Unfälle, die dadurch verursacht werden, dass man ständig auf der Jagd nach Fahrgästen ist.

In den vorhandenen Systemen wird der Fahrgast durch keine Versicherung geschützt.

In der Literatur wird auch das negative Bild des Paratransitsektors gezeichnet. Aus diesem Grunde sehen die Transportplaner und Politiker der erwähnten Städte dieses informelle Transportwesen als unterentwickelt und "Bauern"-Technologie an und bauen dieses Verkehrsmittel ab. Alle beschriebenen Systeme werden jedoch von der Bevölkerung geschätzt und viel benutzt.

Mit diesen Merkmalen als Grundlage schauen wir im dritten Kapitel auf die Entwicklung von Mexiko City. Neben den schon eingeführten Strassenbahn-, Taxi- und Bussystemen entwickelte sich in den fünfziger Jahren das Sammeltaxi, zuerst um während der Stosszeit am Morgen den Verkehr im Zentrum zu entlasten. Da sie eine Bewilligung für die drei geschäftigsten Wochen vor

und nach Weihnachten hatten, konnten Taxis und Privatwagen zusätzliche Fahrgäste aufnehmen. Die Nachfrage war so gross, dass diese Dienstleistung während des ganzen Jahres und des ganzen Tages fortgesetzt wurde, was von den Transportbehörden weitgehend ignoriert wurde.

Während der sechziger Jahre gab es eine grössere Nachfrage in den Gebieten ausserhalb des Zentrums, und zwar wegen der Abwanderer von der Hauptstadt und vom Land selbst in die Peripherie. Ueberall wurden ausserhalb des Federal Districts auf billigem Land des Bundesstaates Mexiko Siedlungen errichtet. Wegen der nicht erschlossenen und hügeligen Gebiete und der Geschwindigkeit, mit der gebaut wurde, gab es gar keine oder nur wenige öffentliche Verkehrsmittel. Der Bau der Metro am Ende der sechziger Jahre verstärkte die Nachfrage nach einem weitmaschigen Netz von "Zubringern" in den äusseren Stadtgebieten. Nachbarschaftsgruppen organisierten informelle Sammeltaxigesellschaften, um Arbeiter am Morgen zur Metro-Endstation zu befördern und am Abend vom öffentlichen Verkehrsnetz in den Bundesstaat Mexiko.

Von 1970 bis 1980 gab es sowohl im Zentrum als auch an der Peripherie eine enorme Expansion auf diesem Sektor. Spontan entstanden neue Strecken, auf denen Privatwagen benutzt wurden, und somit entstand ein illegales Transportsystem. Im Jahre 1976 registrierte die Abgeordnetenversammlung des Federal Districts 33 Sammeltaxigesellschaften und 32 Gesellschaften für "spezielle Dienste". Die letzteren wurden bekannt als "Tolerados" oder tolerierte Gesellschaften. Diese sind zwar illegal, aber notwendig. Sie arbeiten unter dem Schutz einer "Amparo" oder zeitlich begrenzten richterlichen Anordnung. Der grösste Zuwachs wird bei den Tolerado-Gesellschaften verzeichnet: 1970 gab es 86 Fahrzeuge, 1980 15'000.

Die Dissertation beschäftigt sich dann mit der äusseren und inneren Kontrolle über diese Gesellschaften. Nach aussen hin gehört der Sektor des Sammeltaxis zum Verkehrsdepartement. Dieses Departement gab vom Jahre 1981 an Bewilligungen für nicht regi-

strierte Fahrzeuge. Illegale Strecken, der vermehrte Gebrauch von Privatwagen und der weitverbreitete Verkauf von Amparos haben zur Folge, dass von seiten der Regierung nur wenig Kontrolle auf Fahrer und Wagen ausgeübt werden kann. Sehr verbreitet sind Verstösse wegen der Anzahl der beförderten Fahrgäste, der Geschwindigkeit und der unvollständigen oder gar fehlenden Nummernschilder des Wagens. Von den Verkehrspolizisten werden Bussen erhoben.

Der gesamte Sektor wird von den Aufsichtsbehörden des Transportdepartements als "Laster und Krankheit" angesehen. Die Organisation jeder einzelnen Gesellschaft ist eine interne Kontrolle. Diese besteht zuerst einmal aus dem Präsidenten, der seine Gesellschaft bei Verbandstreffen vertritt und für Vergrösserungen, Fahrpreise, Fahrpläne und den ruhigen Ablauf verantwortlich ist. Er kann die Strecke und den Fahrplan ändern, um den Ansprüchen der Fahrgäste entgegenzukommen, und er verhandelt auch mit den jeweiligen Polizeibehörden. Jede Gesellschaft ist unabhängig und in Konkurrenz mit den anderen Gesellschaften. Die tägliche Organisation der Routen und die Servicekontrollen werden im Terminal oder vom Fahrdienstleiter auf der Strasse gemacht. Der Fahrdienstleiter überprüft die Fahrzeuge, wenn sie in den Terminal kommen und sorgt dafür, dass die Wagen regelmässig ausfahren. Er ist die Kontaktperson zwischen Fahrern und der Oeffentlichkeit. Durchschnittlich 50 Prozent der Wagen werden vom Besitzer selbst gefahren. Manche Fahrer besitzen mehrere Fahrzeuge. Derjenige Besitzer, der sein Fahrzeug vermietet, erhält wöchentlich eine bestimmte Summe, und sein Einkommen hängt weder von der Anzahl der beförderten Fahrgäste noch von den Arbeitsstunden ab. Die Fahrer selbst haben kein festes Einkommen, keine bezahlten Ferien und keine Ausgleichszahlungen, wenn das Auto wegen Reparaturarbeiten nicht eingesetzt werden kann. Auf der anderen Seite ist der Fahrer, abgesehen von den Zahlungen für die Miete des Wagens, ziemlich unabhängig, was die Arbeitszeit betrifft. An das Terminalbüro muss eine "Cuota" für die Aufwendungen der Organisation gezahlt werden, und der Fahrer muss für Benzin und Unfallkosten aufkommen. Der Fahrer trägt daher die

Schwankungen des Einkommens, die durch Wetterbedingungen und Zahltag der Fahrgäste entstehen. Der Fahrer verdient dadurch, dass er viele Stunden arbeitet, und viele von ihnen machen nur frei, wenn das Auto repariert wird.

Im vierten und fünften Kapitel gehen wir auf Einzelheiten ein, die wir durch den ISTME-Report und die drei Fallstudien zusammengetragen haben. Zuerst einmal beschäftigen wir uns mit der Nachfrage von seiten der Bevölkerung; diesem Punkt sind wir durch Befragungen der Fahrgäste nachgegangen.

Die Befragung des ISTME war eine Probebefragung für die drei Fallstudien. Sie gibt einen allgemeinen Ueberblick über den Anfang und das Ende der Fahrten, die Meinungen der Fahrgäste über die Gesellschaften und die Gründe, weshalb sie diese wählen.

Die zweite Befragung gibt uns vollständigere Informationen über die tägliche Fahrgastbewegung auf drei Strecken. Die Interviews fanden mittels eines beschränkten Fragekatalogs an den Terminals statt. Die ersten Fragen sollten Aufschluss geben über Anfang und Ziel der Fahrten, und diese zeigten uns die wichtigsten Wohngebiete und Arbeitsstätten entlang der drei Strecken.

Die erste Strecke liegt an einer Stadtschnellstrasse, während die anderen zwei "Zubringerstrecken" sind, die Arbeiter vom Bundesstaat Mexiko in die Hauptstadt bringen. Die dritte Strecke ist mit ihren 67 Kilometern die längste Strecke für Sammeltaxis im Gebiet der Metropole und wird deshalb mehr für die wöchentliche als für die tägliche Fahrt in die Stadt benutzt.

An zweiter Stelle wollten wir wissen, warum die Leute "reisen". Auf allen Sammeltaxistrecken wurde die Arbeit als Hauptgrund genannt. Aber auch Studien, Einkaufsfahrten wurden für Fahrten ausserhalb des Federal Districts angegeben. Fahrgäste fahren in die Hauptstadt, um in Warenhäusern einzukaufen oder Ausbildungsstätten zu besuchen.

Der dritte Punkt, dem nachgegangen wurde, war die soziale Schicht oder die Beschäftigung der Fahrgäste.

Da die Gebühren der Sammeltaxis fünfmal so hoch wie die der Busse sein können, hatten wir erwartet, dass weniger Arbeiter und Bedienstete diese Verkehrsmittel benutzen würden. Bei der Studie der ersten Strecke jedoch stellte sich heraus, dass 30 Prozent der Fahrgäste zur Gruppe der Arbeiter gehörten. Die anderen zwei Strecken wurden auch von vielen Studenten, Landarbeitern und Hausfrauen benutzt.

Durch die Befragungen wollten wir auch herausfinden, welche Transportmittel täglich in Verbindung mit dem Sammeltaxi benutzt werden. Dies hängt hauptsächlich von den in den einzelnen Gebieten vorhandenen Verkehrsmitteln ab. Zwei der untersuchten Gesellschaften haben ihre Terminals bei Metrobahnhöfen; somit fuhr die Mehrzahl der Fahrgäste dieser Gesellschaften mit der Untergrundbahn zum Sammeltaxi. 80 Prozent der Befragten benutzten täglich drei oder mehr Verkehrsmittel. Es interessierte uns auch, wieviel Zeit und Geld für die tägliche Fahrt von und zur Arbeit investiert werden. Beides ist recht viel. Die durchschnittliche Fahrzeit beträgt täglich zwei bis drei Stunden. Es gab sogar auf allen drei Strecken Beispiele dafür, dass Fahrgäste täglich vier Stunden oder mehr für den Arbeitsweg benötigten. Das Fahrgeld war entsprechend hoch.

Im fünften Kapitel beschäftigen wir uns mit dem Angebot an Kollektivtaxi. Wir behandeln eingehend, welche Fahrzeuggruppen während des Tages oder während der Woche verfügbar sind. Wir untersuchten Alter und Erfahrung der Fahrer, Alter, Marke und Merkmale der Wagen. Dies ist ganz verschieden, je nach Alter der Gesellschaft. Die gut eingeführte Gesellschaft hat ältere Fahrer und Fahrzeuge, ist weniger darauf eingerichtet, während der Woche den Ansprüchen der Bevölkerung gerecht zu werden und somit auch bei den Fahrgästen nicht so beliebt. Sie wird wegen der schnelleren und bequemer Beförderung den öffentlichen Bussen vorgezogen, aber 30 Prozent der Fahrgäste waren mit den Dienstleistungen unzufrieden. Die zwei neueren Gesellschaften haben jüngere Fahrer und grössere Fahrzeuge. Die Fahrzeiten richten sich mehr nach den Wünschen der Fahrgäste. Auf den Strecken, die

zum Beispiel wöchentlich benutzt werden, nehmen die Fahrer am Mittwoch oder Donnerstag ihren freien Tag, da von Freitag bis Montag der meiste Betrieb ist. So war die Mehrzahl der Fahrgäste der Meinung, dass die angebotene Dienstleistung gut wäre. Schnellerer Transport, Bequemlichkeit und Sicherheit wurden wieder als Gründe für die Benutzung von Sammeltaxis genannt. Am meisten wurde geklagt, dass es zu wenige Fahrzeuge gäbe.

Im letzten Kapitel behandeln wir, welche Stellung das Sammeltaxi innerhalb des gesamten Verkehrssystems einnimmt. Wir kommen zu dem Schluss, dass es neben Bus- und U-Bahnsystemen herlaufen kann, dieses ergänzt und als "Zulieferer" fungiert.

Wir zählen die Vor- und Nachteile des Paratransitsektors auf, den wir in Mexiko City untersucht haben, und analysieren seine Entwicklungsmöglichkeiten in dieser Stadt und in anderen Stadtgebieten.

Wir erfuhren von Regierungsbeamten, dass die Sammeltaxis nicht von der Regierung unterstützt werden, da man hofft, dass die Gesellschaften in Zukunft überflüssig werden. Negativ auswirken können sich die Umweltverschmutzung, der Benzinverbrauch, immer mehr Verkehrsstockungen, Unfälle und das unkontrollierte Anwachsen des Sektors selbst. Positiv für die grösser werdenden Stadtgebiete sind jedoch die Flexibilität der Strecke und der Fahrzeiten, schnelle Beförderung und der Gebrauch von bestehender Infrastruktur. Bei Bedarf kann auch die Anzahl der Fahrzeuge ohne Probleme erhöht werden. Ferner muss kein Geld für kostspielige Technologie ausgegeben werden. Wegen dieser Vorteile schlagen wir Paratransitsysteme auch für andere anwachsende Stadtgebiete vor, unter der Bedingung, dass sie strenger kontrolliert werden als in Mexiko City. Es müssen auch folgende Forderungen erfüllt werden: spezielle Fahrweise, Fahrzeug-Versicherungs- und Abgaskontrollen und zugleich begrenzter Gebrauch von Privatwagen. Dann kann der Paratransit eine Ergänzung zum bestehenden System in dichtbesiedelten Gebieten und an der Peripherie von Städten sein.

